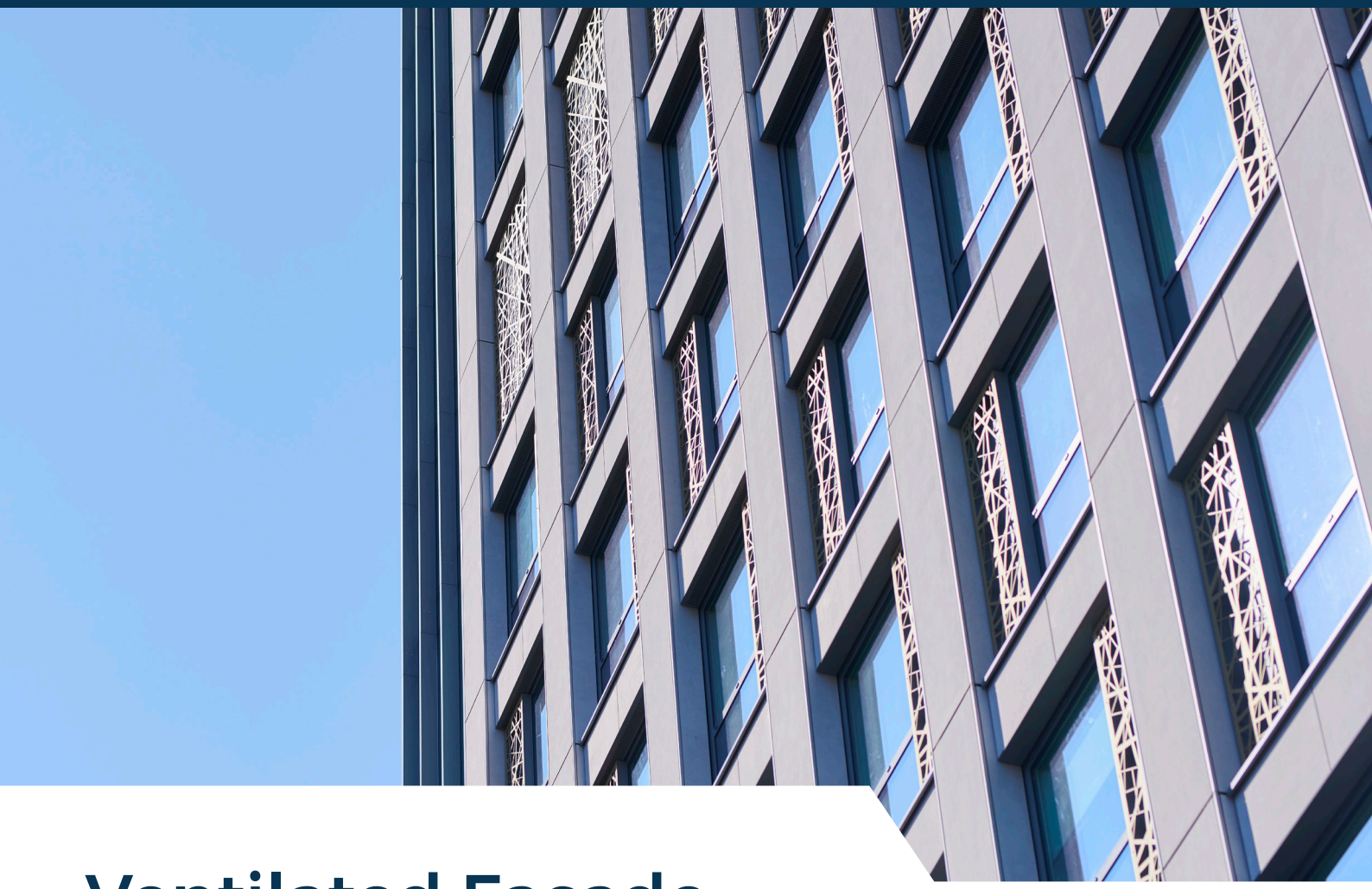
RJ Facades



Ventilated Facade Systems for Cladding Materials

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Company history

RJ Facade Systems partner; architects, designers and contractors, providing access to expert advice from RJ engineers and designers. We have designed and supplied support systems for all the façade materials used in ventilated facades, partnered with the market leading façade contractors, and worked on award winning projects.

RJ Fixings founded in 2000 with a focus to support specialist contractors, operating in safety critical applications, with the best fixings and fixing systems available on the market.

In 2010 RJ and introduced a ventilated façade system, an 'off the shelf' system manufactured in one of Europe's market leading extrusion and fabrication facilities. With fully integrated designer and producer of architectural systems and aluminium profiles for construction applications.

Our mission is to listen and promptly respond to our customers' requests and design and manufacture aluminium products and systems, taking into consideration technical and aesthetic requirements.

The EVT range focuses on sustainable development and has proven its concern about the protection of the natural environment, by making considerable investments in anti-pollution measures and by optimizing production processes, following the applicable standards of the UK and Europe.

Services

RJ Facades supports you with the following:

- Structural facade calculations, design and drawing
- Wind load calculation in accordance to: BS EN 1991-1-4:2005+A1:2010, & EN 1991-1-4:2005 +A1:2010(E)
- Thermal Performance Calculated: Project thermal calculations to confirm insulation thickness available on a project-by-project basis.
- UK and European Certification: Certificate for the UL Mark – Performance of Curtain Walling and Rainscreen Cladding (formerly Winmark approval)
- Professional consultation and technical support: ensured by our engineering team
- Reliable customer care: CAD Support, constant site training, CPD Seminars, technical support and audits on site
- Production of non-standard length profiles and non-standard processing

General Information

EVT Concept
Advantages
Certificates

EVT Concept

- **Ventilated Façade Systems (VFS)** is an element of the building envelope.
- **EVT Systems** are constructed from fully finished components and assemblies.
- **Ventilated Façade Systems (VFS)** is a wall, comprising outer skin panels and an airtight insulated backing wall, separated by a ventilated cavity.

The Ventilated façade ensures protection of the backing walls by integrating the following fundamental aspects:

- **Weatherproofing**
  The VFS shields the backing wall from direct rain

- **Wall's ventilation**
  The characteristic that has always distinguished the VFS from other façade systems is that it creates an air cavity, which ensures the wall's ventilation and protection.

- **Drainage**
  Further penetration of water passing the rainscreen is prevented by the air gap and water is removed from the air gap by drainage and ventilation.

- **Features of the VFS**
  Outer skin of panels, the rainscreen; Air cavity, at least 30 mm deep; Insulated backing wall that controls air leakage.

Advantages of Ventilated Façade Systems

Energy saving and Energy efficiency

The topic of Energy Efficiency is one of the most widely discussed during the last few years. The climate changes are already a fact. The severe exploitation of natural resources is the main reason for that. The depletion of conventional energy resources forces reconsideration of the national energy strategies and make them part of one common World Strategy. The main advantage of EVT ventilated systems is energy saving. The correct design and implementation of the systems reduce energy losses and energy expenses, increases the comfort of the premises, ensure healthy surroundings and help the environmental protection.

Excellent outer appearance

Besides the excellent vision, which is due to the diversity of materials and the combinations between them, the façade materials protect the building's external surface from the environment and keeps its integrity. A new aspect of the ventilated systems – the cladding of photovoltaic panels is possible. This is a non-conventional, "green" energy source.

Natural ventilation and Vapor permeability

Besides the thermal insulation, the natural ventilation and the vapour permeability are also very important for the inner microclimate. The recommended width of the air gap, necessary for the existence of convection, is between 40 and 80 mm. This air gap protects the building from overheating during the summer and cooling down during the winter.

The ventilated façades allow the building to breathe and eliminate the condensation inside the premises. The vapour permeability of the enclosing walls and the thermal insulation let the construction moisture evaporate (this is valid for new buildings), and in premises with higher humidity - to be released outside. The absence of culture for airing the inhabited premises is also a reason for the existence of moisture and microorganisms. Devices with or without sensors are being developed in order to maintain ventilation in frames and suspended façades. This process is natural for the ventilated façades.

Fast mounting and Easy maintenance

An important parameter of EVT systems is the speed of mounting and maintenance. Specially designed to decrease the time for designing and mounting, EVT ventilated systems are the only solution for large façades, short deadlines, safety and excellent vision. A big advantage in the polluted urban environment is the self - cleaning feature of some of the cladding materials and the easy cleaning of the others.

Fire Resistance

This is one of the most important advantages of EVT ventilated systems. Components of the cladding materials are fire resistant. The aluminium brackets, rails and associated rail-to-bracket fixings are non-combustible and, therefore, could be regarded as having a Class 0 or 'low risk' surface in relation to the current National Building Regulations at the time of writing. To limit the risk of fire spread between floors in buildings subject to national Building Regulations, cavity barriers must be incorporated in the cavity behind the systems, as required under these Regulations (for example, intumescent cavity barriers — specific types not covered by this Certificate — or overhanging incombustible breaks at each floor level), but these should not block essential ventilation pathways. Guidance on cavity barriers can be found in BRE Report BR 135:2013, but these are outside the scope of this Certificate.

Sound insulation

The presence of air gap between the cladding material and the thermal insulation provides high level of noise insulation, a parameter which is very important for life in a big, urbanized city.

Durability

The product provides satisfactory durability with a high durability rating from Eurocode EN1999.1.1.2007 (Design of aluminium structures). The system has been designed to avoid the need for disproportionate work when repairing or replacing individual cladding components. Corrosion resistant fixings and bimetallic corrosion has been considered.

Sustainability

Made of aluminium, material which is fully recyclable, EVT VFS systems make a contribution to the creation of building envelope, which is sustainable throughout the whole building lifecycle – from cradle to cradle.

The Building Regulations 2010 (England and Wales)

A.1 Loading: The calculations and test data provided give confidence that this regulation is contributed towards by the products tested and certified.

B4 (1) External fire spread: The aluminium brackets, rails and associated rail-to-bracket fixings are non- combustible and, therefore, could be regarded as having a Class 0 or 'low risk' surface in relation to the current National Building Regulations at the time of writing. Fire certification / performance is outside the scope of this Certificate

7. Materials and workmanship: The evidence of method statements, internal documentation and staff training provided gives confidence that this regulation is contributed towards by the product certified.

Certificates

Manufacturing & system compliance with applicable regulations

- **System Certification**

Certificate for the UL Mark – Performance of Curtain Walling and Rainscreen Cladding (formerly Winmark approval)

- **Performance characteristics of EVT systems**

Ventilated façade systems EVT were certified by notified laboratories all over the world according to the requirements of different standards:

Building Physics
Dimensioning
Formulas
Examples

Aluminium as material

Aluminium is a rather newfound metal, extracted for the first time in 1854. Commercially produced as a precious metal from 1886, its' industrial production for civil applications only achieved wide use in the 1950's.

Now aluminium plays a key role for the sustainability of new buildings and the renovation of existing ones. Thanks to its' performance properties aluminium contributes to the energy performance, safety and comfort of new buildings.

Advantages

- **Design flexibility**
  The extrusion process offers an almost infinite range of forms and sections, allowing designer to integrate numerous functions into on profile

- **Long service life**
  Aluminium building products are made from alloys that are weatherproof, corrosion- resistant and immune to the harmful effect of UV rays, ensuring optimal performance over a long period of time

- **High strength-to-weight ratio**
  Thanks to the metal's inherent strength and stiffness, aluminium window and curtain wall frames can be very narrow. Material's light weight makes it easier to transport and handle on-site, reducing the risk of work- related injury

- **High-reflectivity**
  The characteristic feature makes aluminium a very efficient material for light management. Aluminium shading devices can be used to reduce the need for air condition in summer

- **Fire safety**
  Aluminium does not burn and therefore is classified as a non-combustible construction material (European Fire Class A1).

  Aluminium alloys will nevertheless melt at around 6500 C, but without releasing harmful gases.

- **No release of dangerous substances**
  Several studies have proved that aluminium building product do not present a hazard to occupants or the surrounding environment. Aluminium building products have no negative impact, either on indoor air quality or on soul, surface and groundwater

- **Optimal security**
  Where high security is required, specially designed, strengthened aluminium frames can be used. While the glass for such applications may well be heavy, the overall weight of the structure remains manageable thanks to the light weight of the aluminium frames.

Wind load

Wind actions

The main influence over the wind action, wind load according to Eurocode

In instances where a project wind load value is not provided by the project engineer, RJ Facades are able to provide a wind load calculation, relevant to the construction of the ventilated facade.

The calculation considers, building dimensions, distances from sea, town boundaries, project location, & potential funneling. Final values represent the wind pressure in different zones of the building, especially in the corners where point loading occurs.

The data is accordance to BS EN 1991-1-4:2005+A1:2010 & EN 1991-1-4:2005+A1:2010(E)

Allowable deflection

- **Allowable deflection of substructure**
  According to the requirements of the CWCT Standard for systemized building envelopes, at both positive and negative applications of the peak test pressure, the maximum deflection of the substructure generally should not exceed:

Allowable deflection of some cladding materials

- **Allowable deflection of brittle materials (e.g. plasterboard):**

1/360 of the extent of the board, or 10 mm whichever is the lesser;

- **Allowable deflection of natural stone units:**
  1/360 of their length measured along the stone edge, or 3 mm, whichever is the lesser (smaller) deflections may be ap- propriate depending on the size of stone and method of fixing;

- **Allowable deflection of rainscreen panel:**
  At both positive and negative applications of the peak test pressure, the maximum deflection shall not exceed:
  - 1/90 of the span measured between the points of attachement of the panel for aluminium, glass and steel, or
  - 1/360 of the span measured between the points of attachment, or 3 mm whichever is the lesser, for stone and similar brittle materials, or
  - More restrictive limits set by the panel manufacturer.

Greater deflections may also be allowable.

N.B! The deflection limits should be agreed with the material supplier.

Thermal performance

Thermal Performance Calculated

Project thermal calculations to confirm insulation thickness available on a project by project basis.

The range of helping had brackets is available in aluminium and stainless, including floor spanning configurations. Our technical team calculate the point loss of the bracket specific to your project, in the project specific design to provide solutions that will achieve the buildings required U value.

Thermal properties shall be selected in order to reduce the total in-service energy consumption of the building. These limit the levels of carbon emissions resulting from operation of the building.

Carbon emissions will be lower if the following are reduced:
- Heat transfer through the building envelope.
- Air leakage through the building envelope.
- Cooling loads arising from solar gain.

Heat transfer within an aluminum cladding system mainly affected by three highly correlated factors:
- The external cladding surface material (thermal resistance, solar and heat absorption, etc.
- The characteristics of the air cavity between the external cladding and the main wall element (air movement, air temperature, dimensions)
- The material and characteristics of the brackets that thermally connects the exterior cladding (geometry, material, anchors) with the façade.

Thermal bridging

The thermal bridges caused by subframe mechanical fixing devices and air spaces shall be taken into account, using the appropriate calculation method defined in EN ISO 6946 and EN ISO 10211 standards.

Particular attention shall be given to limiting thermal bridges. Thermal breaks can be used to reduce both U-value and condensation risk. To reduce the risk of condensation, thermal breaks should be placed, so as to form warm fingers and not cold fingers.

Thermostop elements serve only thermal spacers between consoles and structure.

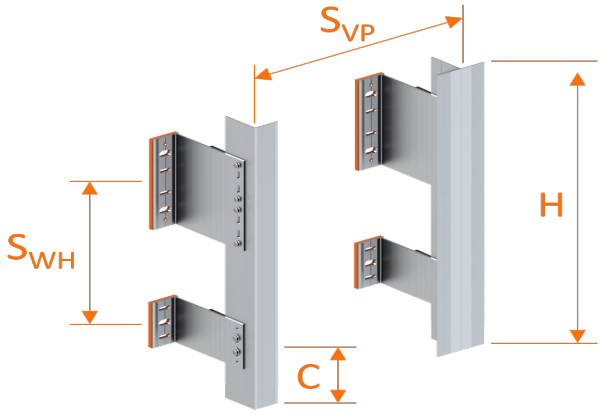
The use of these elements in the two constructions of metal convincingly reduced heat losses and thus are suitable from the viewpoint of building physics.

RJ Facades proposes designed Thermo pads to separate fixing brackets from the structure. Thus, the losses are reduced, but should not be ignored because of the installed fasteners that penetrate the solid wall element.

The characteristics of the bracket are of great importance, since the bracket penetrates the insulation protection and creates a three-dimensional thermal bridge. The contact area between the bracket and the solid wall is a significant factor in thermal losses due to point thermal bridges.

Choosing the appropriate fixing bracket

Simply supported beam with one fixed and one movable support - area A



Fixed support

Self weight - dead load
V = g.3h.b

For determining the maximum permissible wind load the following formula apply:

Wind load-presure
Wp = fl . q . cp . h/2 .

Wind load-suction Ws = q . cp . h/2 .b

where:
V - load, kN
g - weight of main vertical profiles and façade material, kN/m^2
Wp - wind pressure, kN Ws - wind suction, kN
κz - correction factor (height)

q - dynamic load, kN/m^2 cp - correction factor (wind pressure)
h - distance between fixing brackets, m
b - distance between main vertical profiles, m
H - building height, m

Movable support

For determining the maximum permissible wind load the following formula apply

Wind load-presure
Wp = fl . q . cp . h/2 . b

Example

Initial data:
H = 0-15 m (middle zone)

g = 0,41 kN/m^2
fl = 1,25

q = 0,5 kN/ m^2
cp = 0,8 (wind pressure)
cp = - 0,5 (wind suction)
h = 1,828 m

b = 1,5 m

Own weight - dead load

V = g.h.b = 0,065. 1,828 . 1,5 = = 0.178 kN

Wind load

Wp = fl . q . cp . h/2 . b = 1,25 . 0,41 . 0,8 . 0.914 . 1,5= = 0,562 kN

Ws = q . cp . h/2 . b = 0,41 . (-0,6) . 0,914 . 1,5 = = (-0,337) = 0,337 kN

Wind load
Wp = fl . q . cp . h/2 . b = = 1,25 . 0,41 . 0,8 . 0,914 . 1,5 = = 0,562 kN

Ws = q . cp . h/2 . b = = 0,41 . (-0,6) . 0,914 .1,5 = = (-0,337) = 0,337 kN

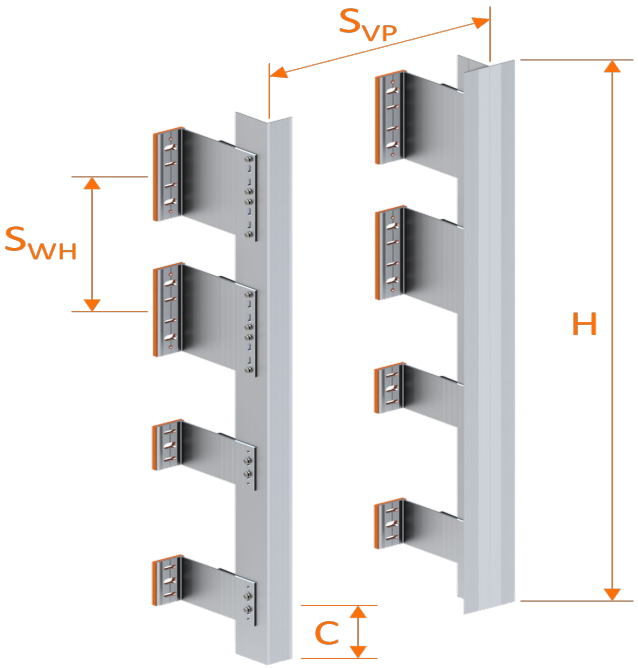
Finally, we choose the appropriate fixing bracket with greater bearing capacity than the calculated value. Fixing bracket for fixed support must bear both calculated values for dead load and wind load.

Fixing bracket for movable support must bear just wind load.

All static calculations must be verified by a responsible structural/façade engineer on site.

Choosing the appropriate fixing bracket

Continuous supported beam with one fixed and three movable supports – area B



Fixed support

Self weight - dead load
V = g.3h.b

For determining the maximum permissible wind load the following formula apply:

Wind load-presure
Wp = fl . q . cp . h/2 . b

Wind load-suction
Ws= q . cp . h/2 .b

where:
V - load, kN
g - weight of main vertical profiles and façade material, kN/m^2
Wp - wind pressure, kN
Ws - wind suction, kN
ĸz - correction factor (height)
q - dynamic load, kN/m^2
cp - correction factor (wind pressure)
h - distance between fixing brackets, m
b - distance between main vertical profiles, m
H - building height, m

Movable support (middle)

For determining the maximum permissible wind load the following formula apply:

Wind load-presure
Wp = fl . q . cp . h . b

Wind load-suction
W s= q . cp . h .b

Example

Initial data:
H = 0-15 m (middle zone)

g = 0.065 kN/m^2
fl = 1,25

q = 0,41 kN/m^2
cp = 0,8 (wind pressure) cp= -0,6 (wind suction)
h = 1,616 m
h/2 = 0,808 m
b = 1,5 m

Own weight - dead load

V = g.3h.b = 0,065. 4,85 . 1,5= = 0.472 kN

Wind load

Wp = fl . q . cp . h/2 . b = =1 ,25 . 0,41 . 0,8 . 0,808 . 1.5 = = 0,496 kN

Ws = q . cp . h/2 . b = = 0,41 . (-0,6) . 0,808 . 1,5 = = 0,298 kN

Wind load
Wp = fl . q . cp . h . b = = 1,25 . 0,41 . 0,8 . 1,616 . 1,5 = = 0,994 kN

Ws = q . cp . h . b = = 0,41 . (-0,6) . 1,616 . 1,5= = (-0,596) = 0,596 kN

Movable support (end)

For determining the maximum permissible wind load the following formula apply:

Wind load-presure
Wp= fl . q . cp . h/2 . b

Wind load-suction
Ws = q . cp . h/2 .b

Wind load

Wp = fl . q . cp . h/2 . b = = 1 ,25 . 0,41 . 0,8 . 0,808 . 1,5 = = 0,497 kN

Ws = q . cp . h/2 . b = = 0,41 . (-0,6) . 0,808 . 1,5 = = (-0,298) = 0,298 kN

Finally we choose the appropriate fixing bracket with bigger bearing capacity than the calculated value. Fixing bracket for fixed support must bear both calculated values for dead load and wind load.

Fixing bracket for movable support must bear just wind load.

All static calculations must be verified by a responsible structural/façade engineer on site.

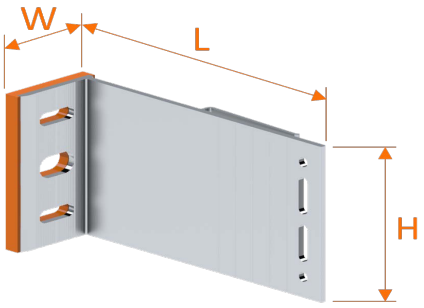
EVT II Helping Hand Brackets

EVT II & EVT Aluminium L-Brackets
EVT II Stainless L Brackets
EVT II Al. & Stainless U Brackets
EVT II Horizontal Adaptor
EVT II Aluminium Soffit L Brackets

EVT II - Aluminium FPH & SPH, for Concrete and SFS Standard L Brackets

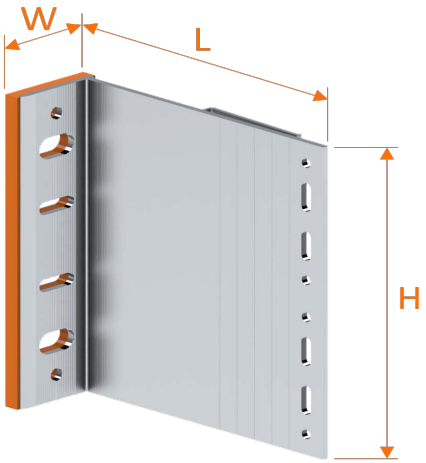
Fixing brackets					Suitable Thermo pads
Code	Type	H (mm)	W (mm)	L (mm)	Type
130170	single	80	42	40	130530 Single
130171	single	80	42	60	
130172	single	80	42	80	
130173	single	80	42	100	
130174	single	80	42	120	
130175	single	80	42	140	
130176	single	80	42	160	
130177	single	80	42	180	
130178	single	80	42	200	
130179	single	80	42	220	
130180	single	80	42	240	
130181	single	80	42	260	
130182	single	80	42	280	
130183	single	80	42	300	
130184	single	80	42	320	

Single fixing bracket



Fixing brackets					Suitable Thermo pads
Code	Type	H (mm)	W (mm)	L (mm)	Type
130185	double	160	42	40	130531 Double
130186	double	160	42	60	
130187	double	160	42	80	
130188	double	160	42	100	
130189	double	160	42	120	
130190	double	160	42	140	
130191	double	160	42	160	
130192	double	160	42	180	
130193	double	160	42	200	
130194	double	160	42	220	
130195	double	160	42	240	
130195	double	160	42	260	
130197	double	160	42	280	
130198	double	160	42	300	
130199	double	160	42	320	

Double fixing bracket



EVT II fixing brackets allow to set the distance of the cladding material from the substrate from a minimum 47mm up to maximum 362mm when used in conjunction with the 60x40x2 mm L-Profile (including thermopad)

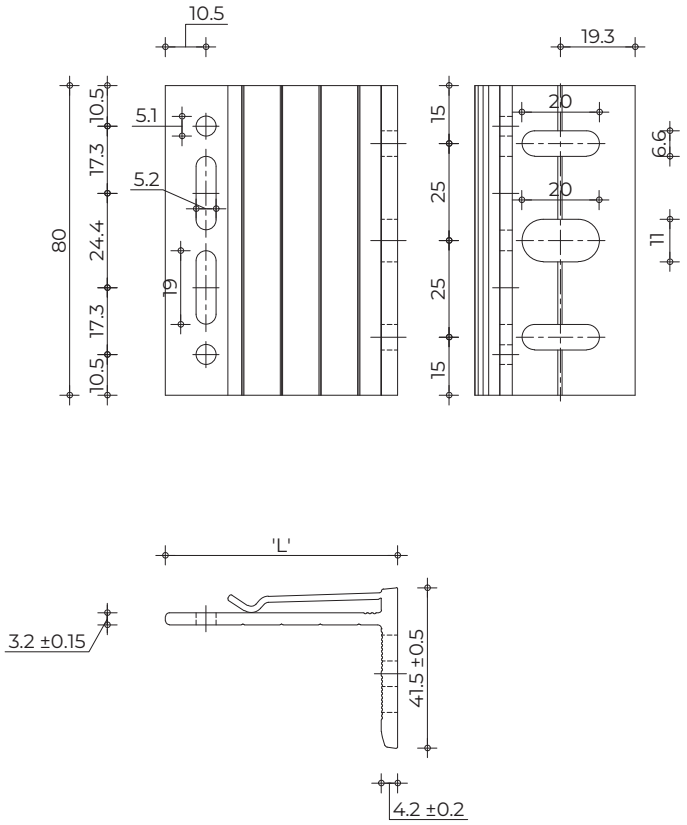
EVT II L-Brackets, Aluminium Performance Table

The performance characteristics of all EVT II fixing brackets are tested in laboratory conditions for the worst-case scenario. The aim of the test is to determine the dead load and wind capacity of the brackets and their fixings to the subframe under tension and shear loads.

Summary of results from testing of EVT II L-brackets, Aluminium

Code	Type	Size(mm)	Material	Base	Design Resistance (kN)	
					Vertical (kN)	Horizontal (kN)
130170	single	42x40x80	aluminium	concrete/sfs	5.06	2.75
130171	single	42x60x80	aluminium	concrete/sfs	3.53	2.75
130172	single	42x80x80	aluminium	concrete/sfs	1.87	1.95
130173	single	42x100x80	aluminium	concrete/sfs	1.69	2.04
130174	single	42x120x80	aluminium	concrete/sfs	1.28	2.09
130175	single	42x140x80	aluminium	concrete/sfs	1.06	2.04
130176	single	42x160x80	aluminium	concrete/sfs	0.96	1.95
130177	single	42x180x80	aluminium	concrete/sfs	1.18	2.00
130178	single	42x200x80	aluminium	concrete/sfs	1.07	2.00
130179	single	42x220x80	aluminium	concrete/sfs	0.85	2.00
130180	single	42x240x80	aluminium	concrete/sfs	0.88	1.95
130181	single	42x260x80	aluminium	concrete/sfs	0.81	2.00
130182	single	42x280x80	aluminium	concrete/sfs	0.66	2.01
130183	single	42x300x80	aluminium	concrete/sfs	0.68	1.94
130184	single	42x320x80	aluminium	concrete/sfs	0.64	1.94
130185	double	42x40x160	aluminium	concrete/sfs	10.12	6.00
130186	double	42x60x160	aluminium	concrete/sfs	9.57	4.54
130187	double	42x80x160	aluminium	concrete/sfs	6.70	3.77
130188	double	42x100x160	aluminium	concrete/sfs	4.91	3.77
130189	double	42x120x160	aluminium	concrete/sfs	4.12	3.77
130190	double	42x140x160	aluminium	concrete/sfs	3.46	3.77
130191	double	42x160x160	aluminium	concrete/sfs	3.00	3.77
130192	double	42x180x160	aluminium	concrete/sfs	2.75	3.81
130193	double	42x200x160	aluminium	concrete/sfs	2.59	3.81
130194	double	42x220x160	aluminium	concrete/sfs	2.39	4.02
130195	double	42x240x160	aluminium	concrete/sfs	2.06	3.81
130195	double	42x260x160	aluminium	concrete/sfs	1.99	3.81
130197	double	42x280x160	aluminium	concrete/sfs	1.75	3.81
130198	double	42x300x160	aluminium	concrete/sfs	1.62	3.81
130199	double	42x320x160	aluminium	concrete/sfs	1.42	3.81

EVT II - L-Brackets, Aluminium
Single bracket, Lengths 40-60mm

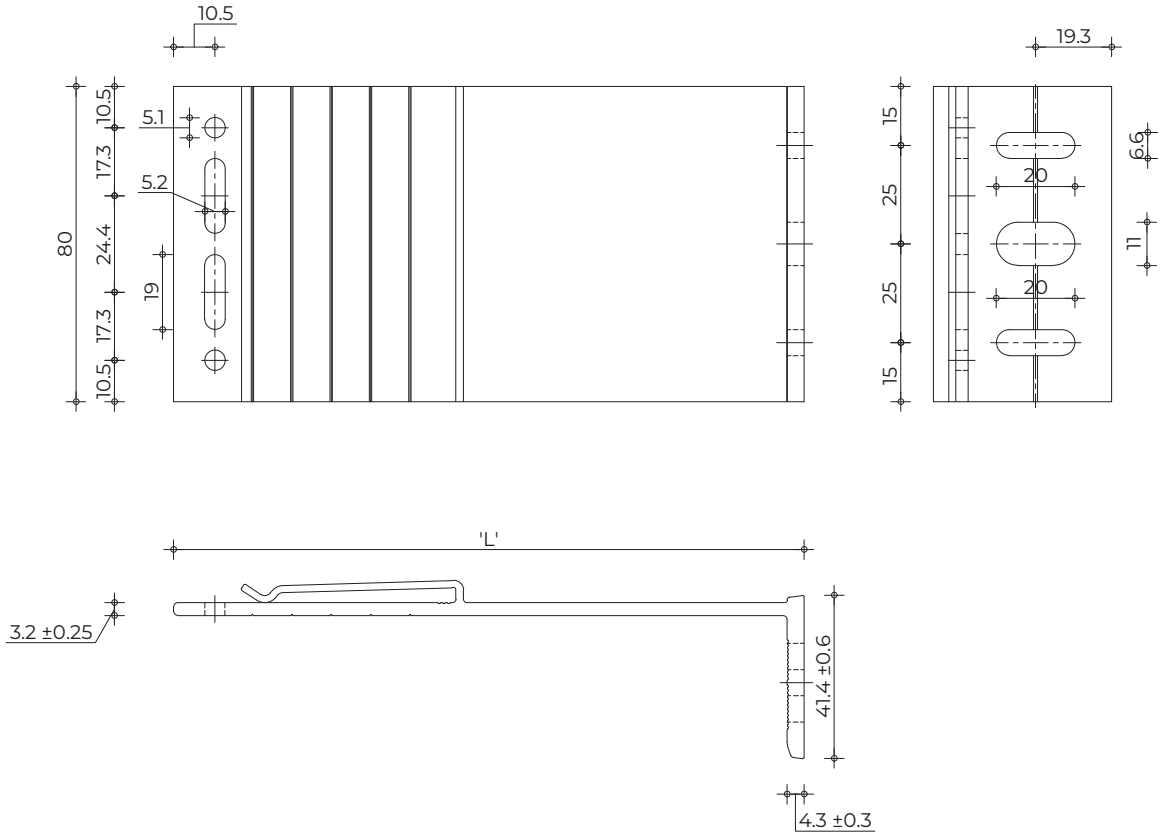


Suitable for concrete, masonry, steel and timber

Item	Material
L-Bracket	Aluminium - EN AW 6063 T6

L =
40mm
60mm

EVT II - L-Brackets, Aluminium
Single bracket, Lengths 80-260mm

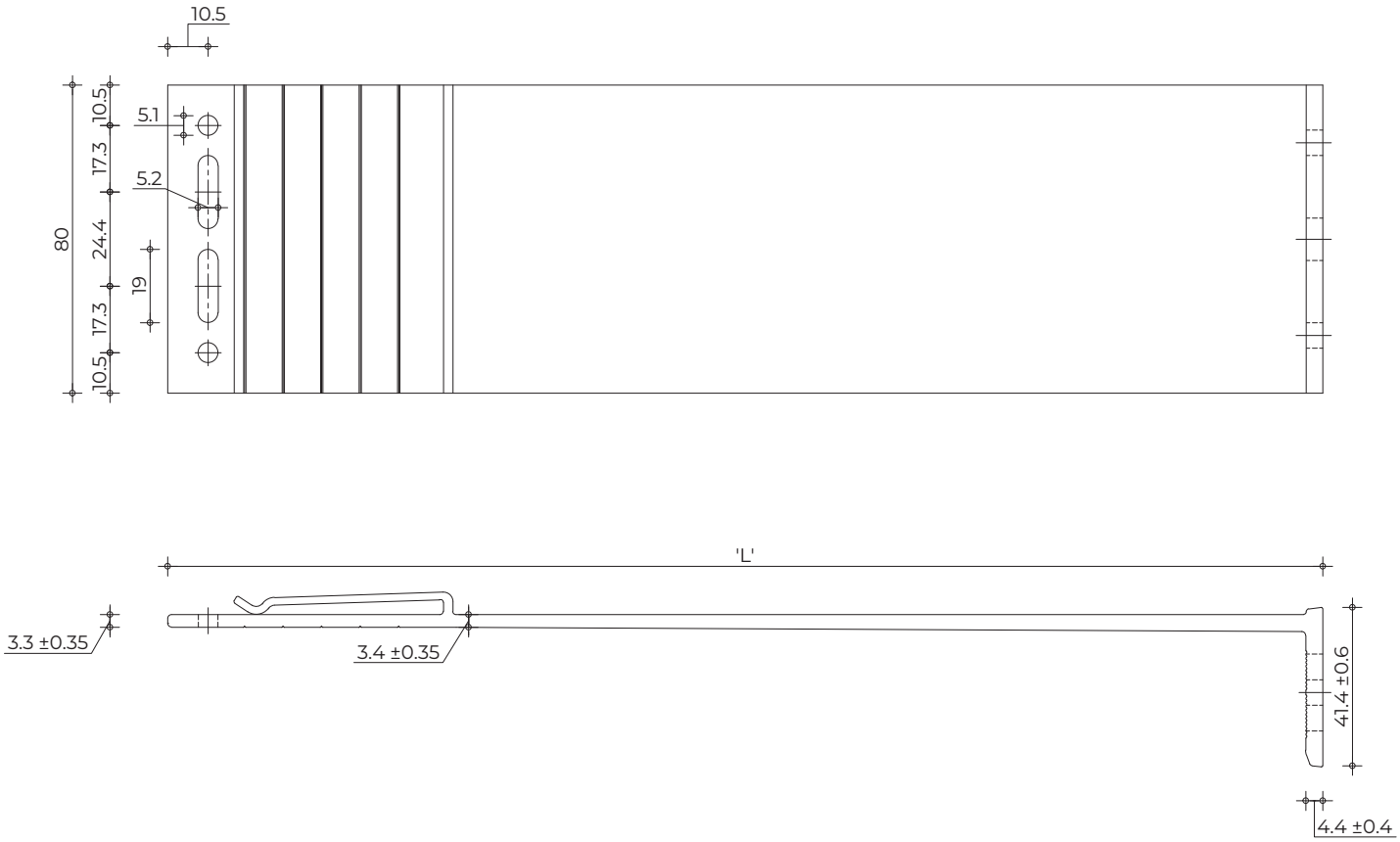


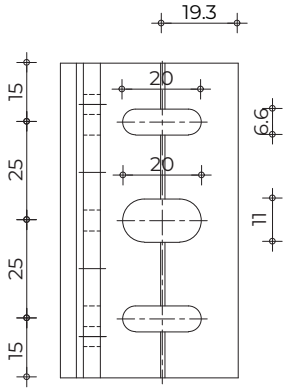
Suitable for concrete, masonry, steel and timber

Item	Material
L-Bracket	Aluminium - EN AW 6063 T6

L =
80mm
100mm
120mm
140mm
160mm
180mm
200mm
220mm
240mm
260mm

EVT II - L-Brackets, Aluminium
Single bracket, Lengths 280-320mm



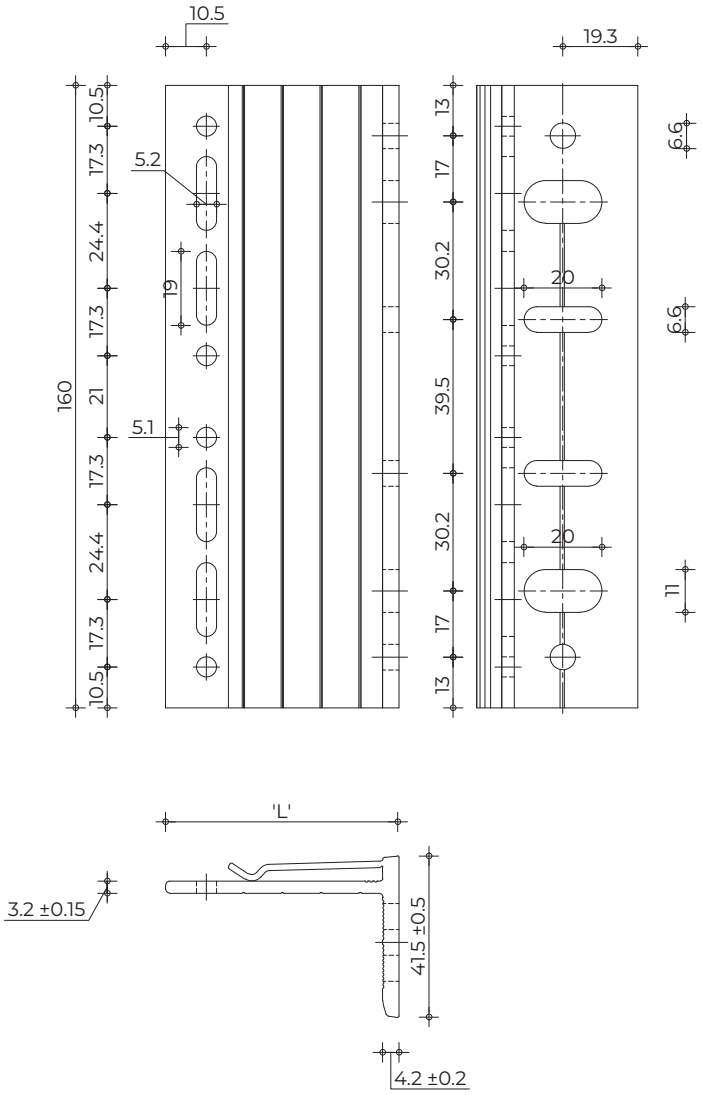


Suitable for concrete, masonry, steel and timber

Item	Material
L-Bracket	Aluminium - EN AW 6063 T6

L =
280mm
300mm
320mm

EVT II - L-Brackets, Aluminium
Double bracket, Lengths 40-60mm

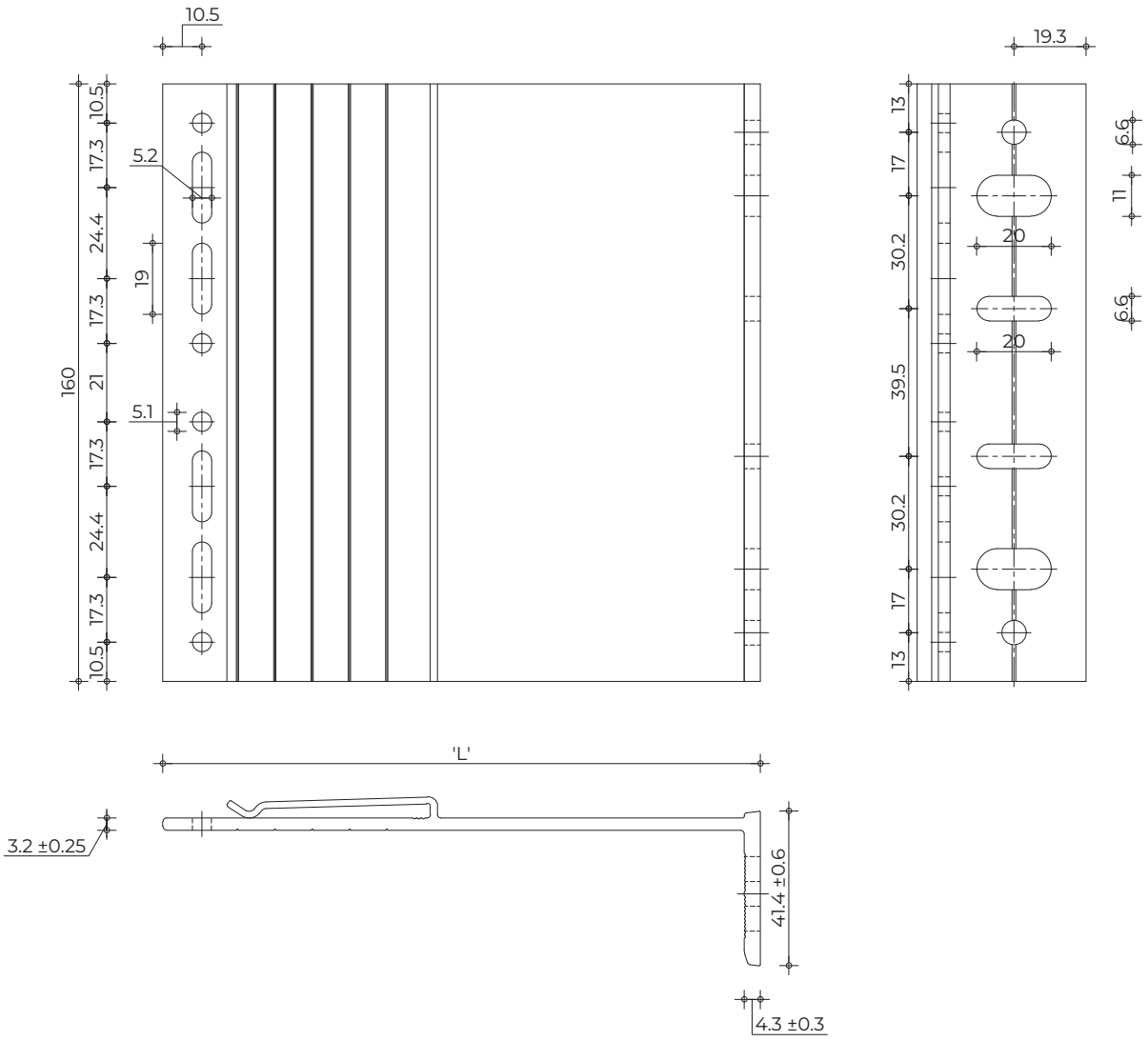


Suitable for concrete, masonry, steel and timber

Item	Material
L-Bracket	Aluminium - EN AW 6063 T6

L =
40mm
60mm

EVT II - L-Brackets, Aluminium
Double bracket, Lengths 80-260mm

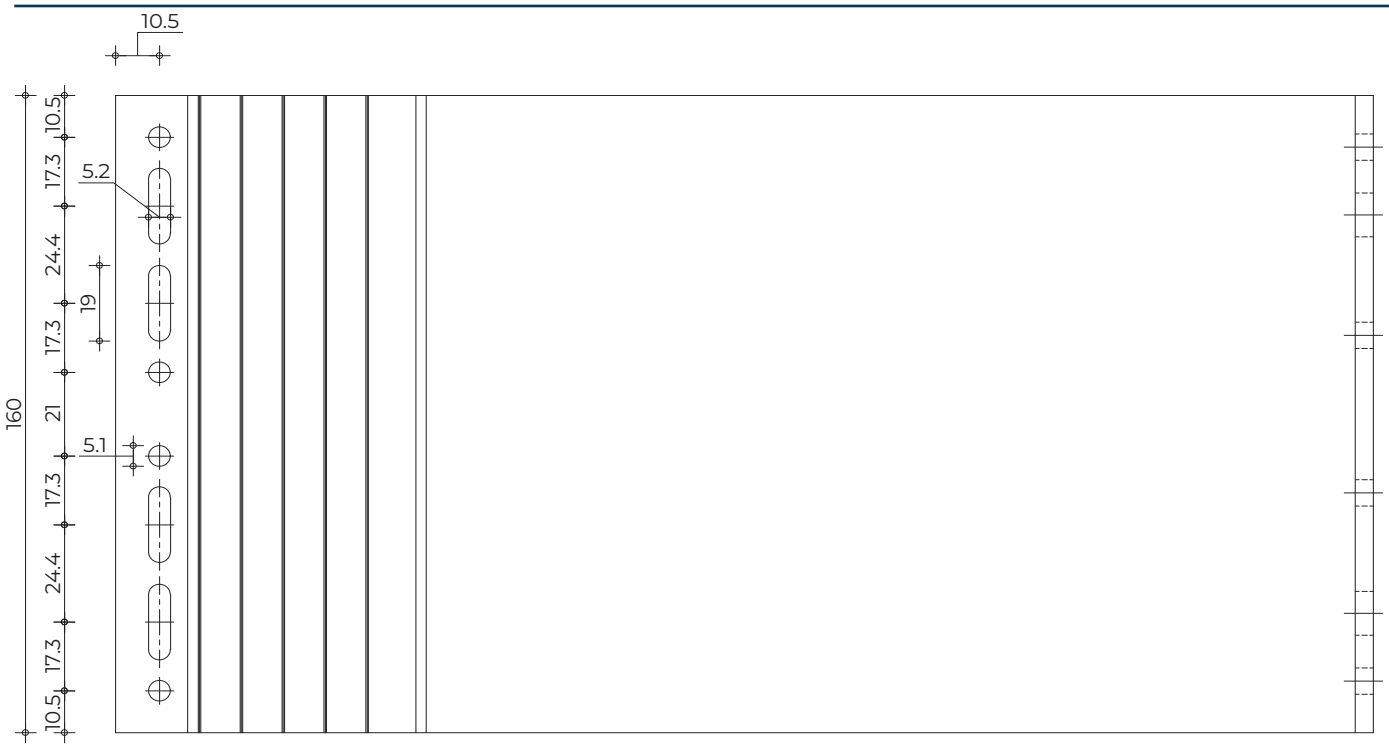


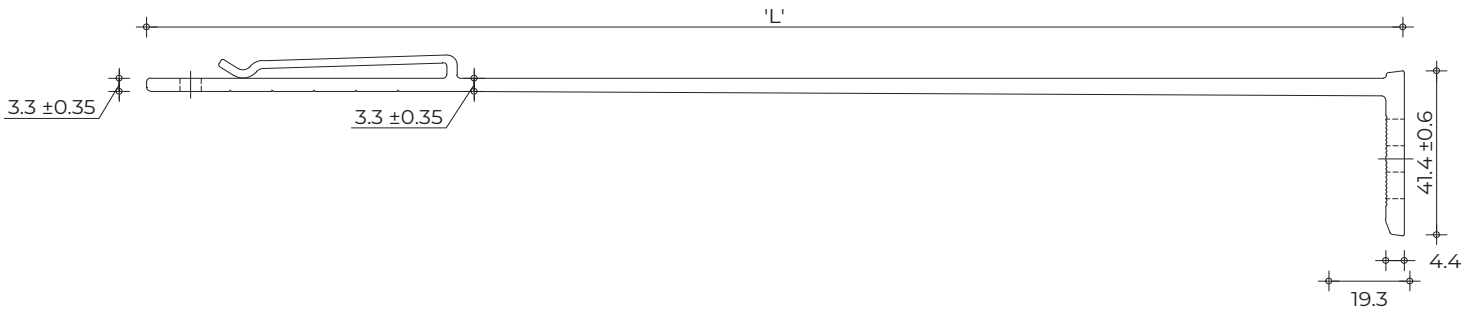
L =
80mm
100mm
120mm
140mm
160mm
180mm
200mm
220mm
240mm
260mm

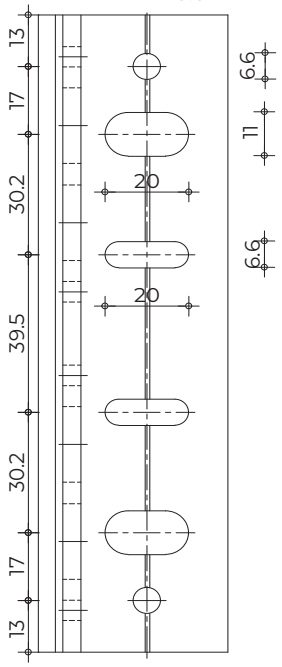
Suitable for concrete, masonry, steel and timber

Item	Material
L-Bracket	Aluminium - EN AW 6063 T6

EVT II - L-Brackets, Aluminium
Double bracket, Lengths 280-320mm





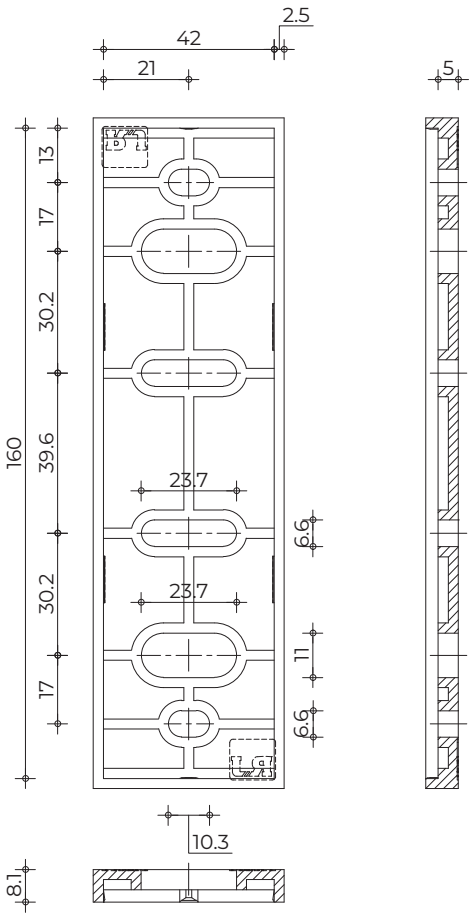


Suitable for concrete, masonry, steel and timber

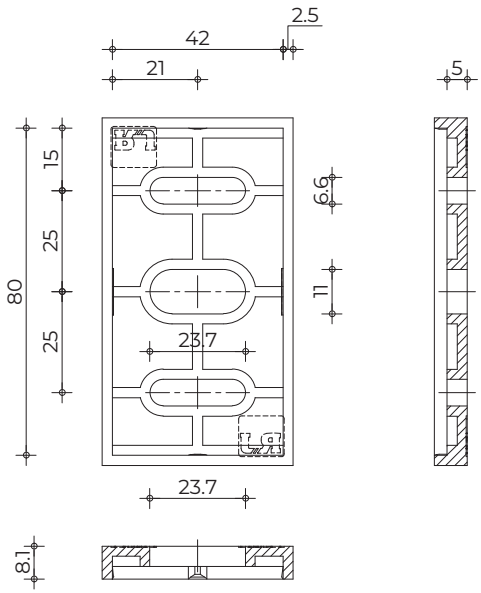
Item	Material
L-Bracket	Aluminium - EN AW 6063 T6

L =
280mm
300mm
320mm

EVT II – Thermo Pads, Polypropylene
Single and double for EVT II L-brackets 40-320mm



Double Thermo pad



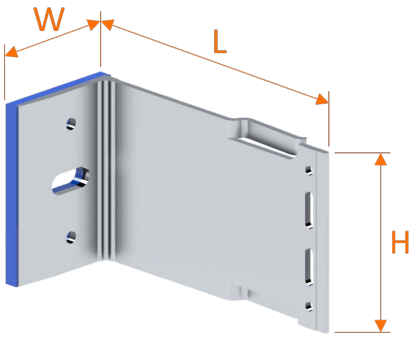
Single Thermo pad

L-Brackets Components
Suitable for Concrete, Steel and timber

EVT - Aluminium FPH & SPH, for Concrete and SFS Standard L Brackets

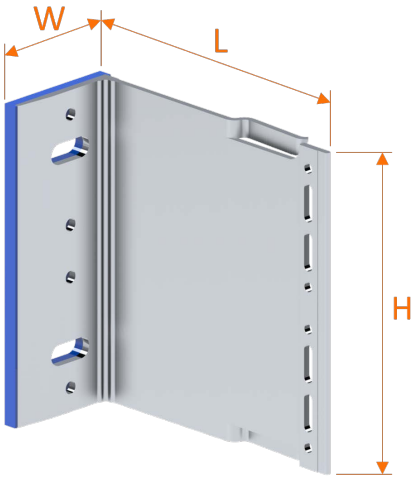
Fixing brackets					Suitable Thermo pads
Code	Type	H (mm)	W (mm)	L (mm)	Type
515872	single	80	62	40	534726 Single
516371	single	80	62	75	
516376	single	90	60	100	515873 Single
516380	single	90	60	125	
516378	single	90	60	150	
515870	single	90	60	180	
516382	single	90	60	210	
517916	single	90	60	240	
522404	single	90	60	270	

Single fixing bracket



Fixing brackets					Suitable Thermo pads
Code	Type	H (mm)	W (mm)	L (mm)	Type
515871	double	160	62	40	535528 Double
516384	double	160	62	75	
516377	double	160	60	100	535529 Double
516381	double	160	60	125	
516379	double	160	60	150	
515869	double	160	60	180	
516383	double	160	60	210	
517918	double	160	60	240	
522403	double	160	60	270	

Double fixing bracket



EVT L-Brackets, Aluminium Performance Table

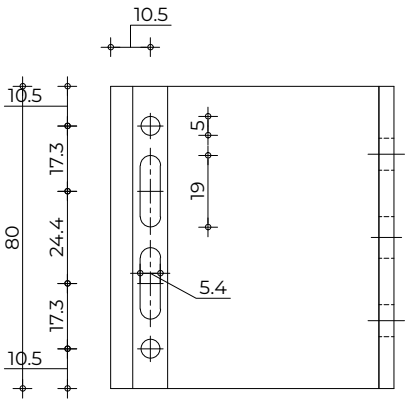
The performance characteristics of all EVT fixing brackets is tested in laboratory conditions for the worst case scenario.

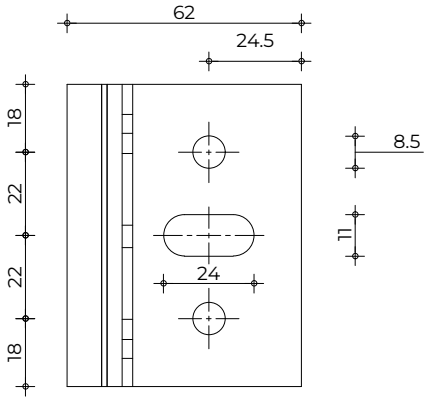
The aim of the test is to determine the load bearing capacity and wind resistance of the brackets and their fixings to the subframe under tension and shear loads.

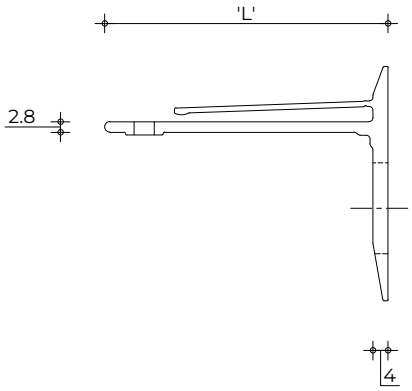
Summary of results from testing of EVT L-brackets, Aluminium

Code	Type	Size(mm)	Material	Base	Design Resistance (kN)	
					Vertical	Horizontal
515872	single	62/40/80	aluminium	concrete/sfs	5.53 kN	1.95 kN
516371	single	62/75/80	aluminium	concrete/sfs	2.74 kN	1.95 kN
516376	single	60/100/90	aluminium	concrete/sfs	1.91 kN	1.95 kN
516380	single	60/125/90	aluminium	concrete/sfs	1.48 kN	1.95 kN
516378	single	60/150/90	aluminium	concrete/sfs	1.20 kN	1.95 kN
515870	single	60/180/90	aluminium	concrete/sfs	0.98 kN	1.95 kN
516382	single	60/210/90	aluminium	concrete/sfs	0.91 kN	1.95 kN
517916	single	60/240/90	aluminium	concrete/sfs	0.72 kN	1.95 kN
522404	single	60/270/90	aluminium	concrete/sfs	0.63 kN	1.95 kN
515871	double	62/40/160	aluminium	concrete/sfs	12.56 kN	4.46 kN
516384	double	62/75/160	aluminium	concrete/sfs	7.50 kN	4.46 kN
516377	double	60/100/160	aluminium	concrete/sfs	5.30 kN	4.47 kN
516381	double	60/125/160	aluminium	concrete/sfs	4.07 kN	4.45 kN
516379	double	60/150/160	aluminium	concrete/sfs	3.31 kN	4.46 kN
515869	double	60/180/160	aluminium	concrete/sfs	2.71 kN	4.50 kN
516383	double	60/210/160	aluminium	concrete/sfs	2.32 kN	4.36 kN
517918	double	60/240/160	aluminium	concrete/sfs	1.98 kN	4.46 kN
522403	double	60/270/160	aluminium	concrete/sfs	1.74 kN	4.46 kN

EVT - L-Brackets, Aluminium
Sliding Point Bracket, Lengths ≤ 75mm





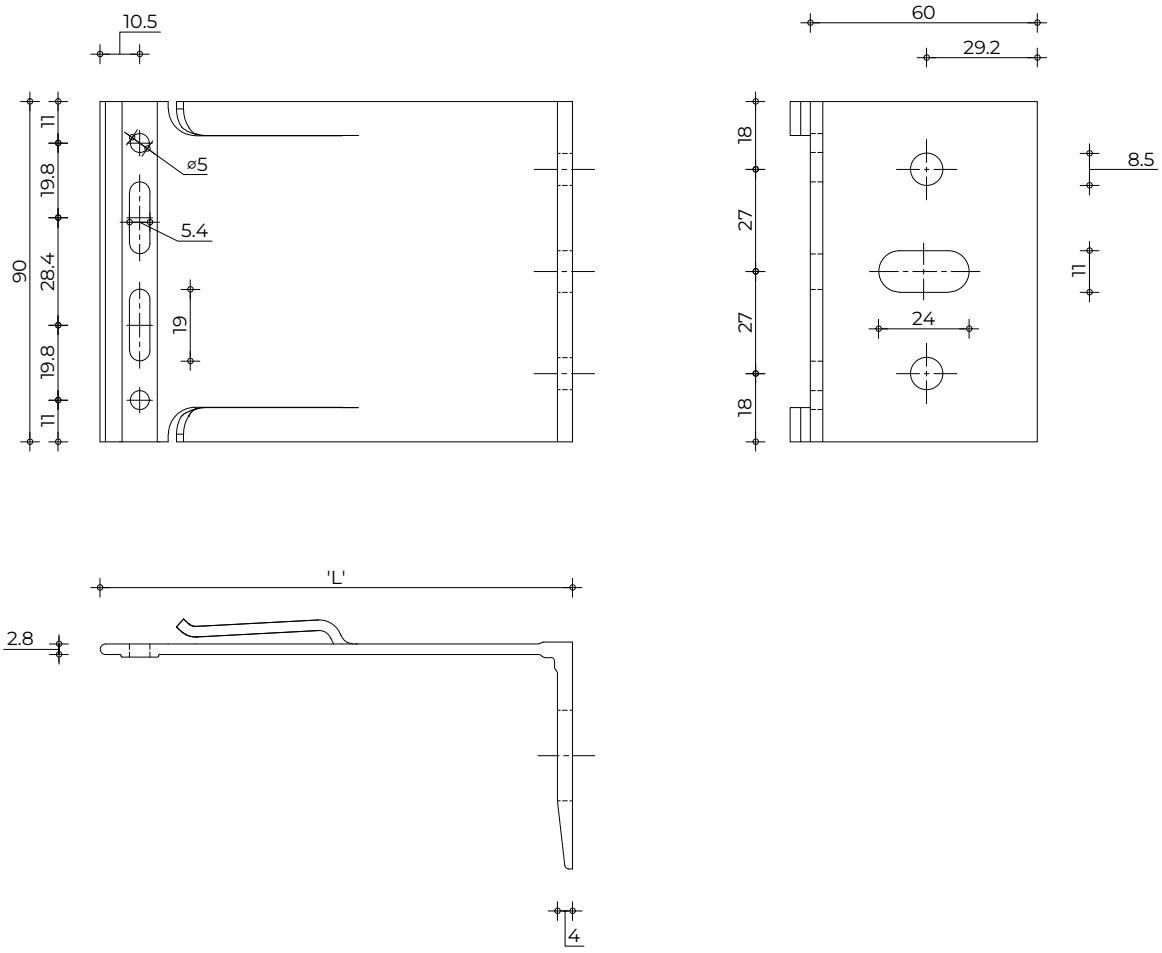


L-Bracket Single, Lengths ≤ 75mm
Suitable for Concrete, Masonry, Steel and Timber

Item	Material
L-Bracket	Aluminum - EN AW 6063 T6

L =
40mm
75mm

EVT - L-Brackets, Aluminium
Sliding Point Bracket, Lengths > 75mm

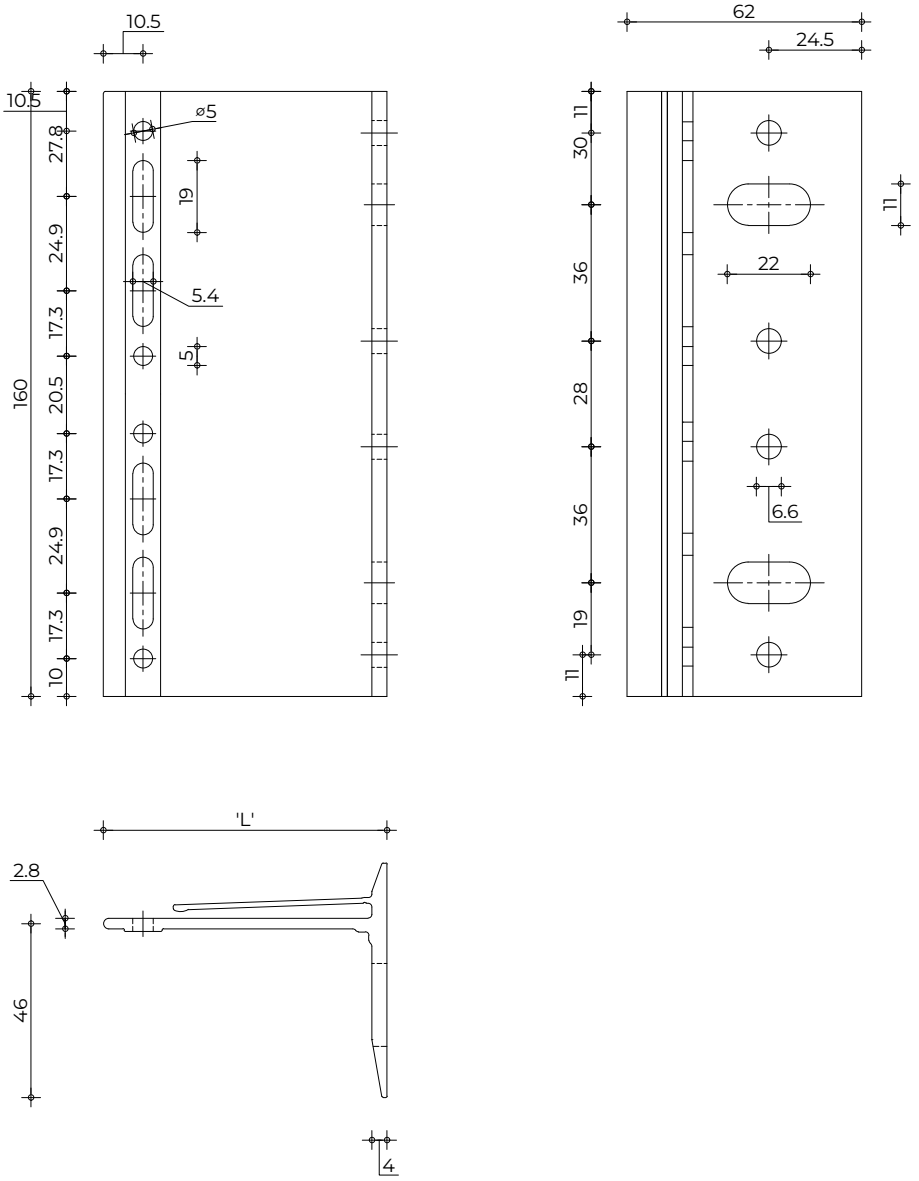


L-Bracket Single, Lengths > 75mm
Suitable for Concrete, Masonry, Steel and Timber

Item	Material
L-Bracket	Aluminum - EN AW 6063 T6

L =
100mm
125mm
150mm
180mm
210mm
240mm
270mm

EVT - L-Brackets, Aluminium
Fixed Point Bracket, Lengths ≤ 75mm

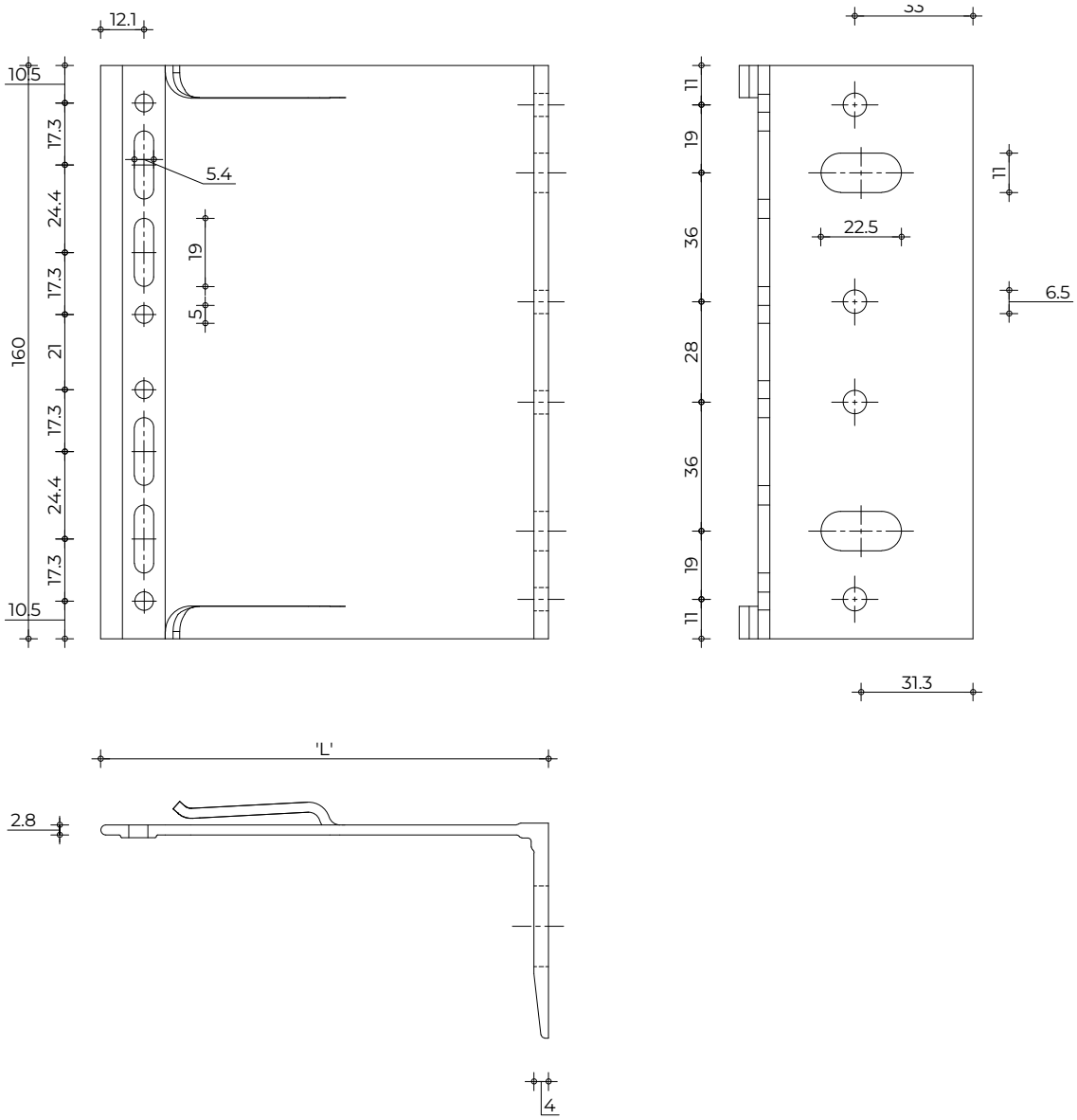


L-Bracket Double, Lengths ≤ 75mm
Suitable for Concrete, Masonry, Steel and Timber

Item	Material
L-Bracket	Aluminum - EN AW 6063 T6

L =
40mm
75mm

EVT - L-Brackets, Aluminium
Fixed Point Bracket, Lengths > 75mm



L-Bracket Double, Lengths > 75mm
Suitable for Concrete, Masonry, Steel and Timber

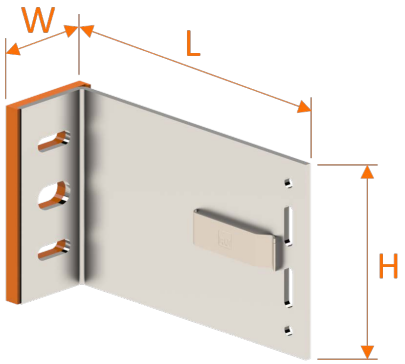
Item	Material
L-Bracket	Aluminum - EN AW 6063 T6

L =
100mm
125mm
150mm
180mm
210mm
240mm
270mm

EVT - Stainless FPH & SPH, for Concrete and SFS Standard L Brackets

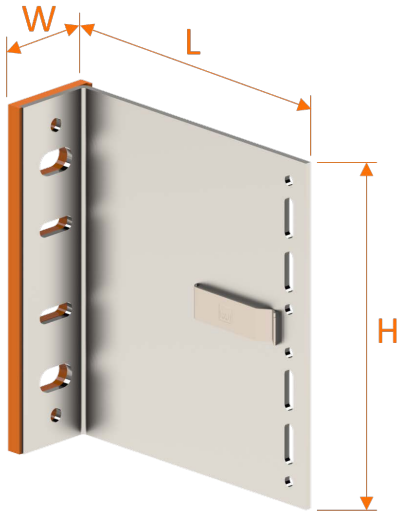
Fixing brackets					Suitable Thermo pads
Code	Type	H (mm)	W (mm)	L (mm)	Type
300409	single	80	42	60	515873 single
300410	single	80	42	80	
300411	single	80	42	100	
300412	single	80	42	120	
300414	single	80	42	140	
300415	single	80	42	160	
300416	single	80	42	180	
300417	single	80	42	200	
300418	single	80	42	220	
300419	single	80	42	240	
300421	single	80	42	260	
300422	single	80	42	280	
300423	single	80	42	300	
300424	single	80	42	320	

Single fixing



Fixing brackets					Suitable Thermo pads
Code	Type	H (mm)	W (mm)	L (mm)	Type
300428	double	160	42	60	535529 double
300429	double	160	42	80	
300430	double	160	42	100	
300431	double	160	42	120	
300433	double	160	42	140	
300434	double	160	42	160	
300435	double	160	42	180	
300436	double	160	42	200	
300437	double	160	42	220	
300438	double	160	42	240	
300440	double	160	42	260	
300441	double	160	42	280	
300442	double	160	42	300	
300443	double	160	42	320	

Double fixing bracket



EVT fixing brackets allow to distance the cladding material from the backing wall from min 68mm up to max 312mm with 60mm T profile It's possible to adjust the profile up to 33mm (Lmin to Lmax)

EVT II L-Brackets, Stainless Steel Performance Table

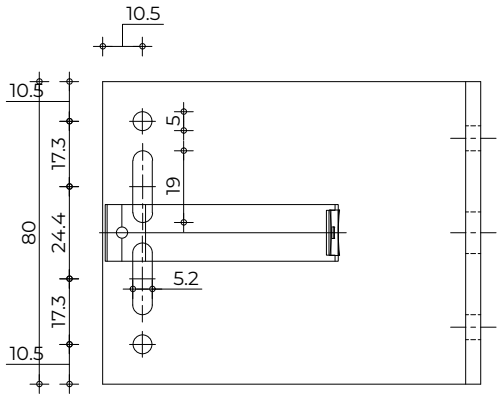
The performance characteristics of all EVT fixing brackets is tested in laboratory conditions for the worst case scenario.

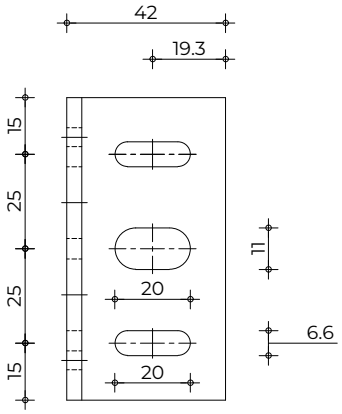
The aim of the test is to determine the load bearing capacity and wind resistance of the brackets and their fixings to the subframe under tension and shear loads.

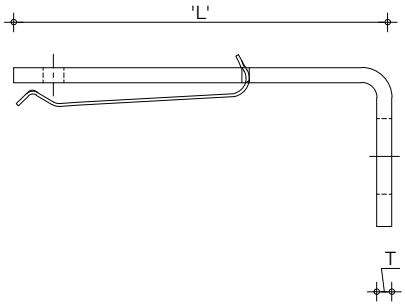
Summary of results from testing of EVT II L-brackets, Stainless Steel

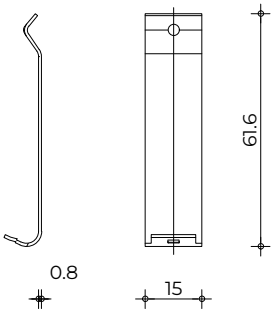
Code	Type	Size(mm)	Material	Base	Design Resistance (kN)	
					Vertical	Horizontal
300409	single	42/60/80	stainless	concrete/sfs	4.74 kN	2.85 kN
300410	single	42/80/80	stainless	concrete/sfs	3.46 kN	2.85 kN
300411	single	42/100/80	stainless	concrete/sfs	2.69 kN	2.66 kN
300412	single	42/120/80	stainless	concrete/sfs	2.23 kN	2.66 kN
300414	single	42/140/80	stainless	concrete/sfs	1.80 kN	2.86 kN
300415	single	42/160/80	stainless	concrete/sfs	1.57 kN	2.86 kN
300416	single	42/180/80	stainless	concrete/sfs	1.37 kN	2.66 kN
300417	single	42/200/80	stainless	concrete/sfs	1.22 kN	2.66 kN
300418	single	42/220/80	stainless	concrete/sfs	1.10 kN	2.66 kN
300419	single	42/240/80	stainless	concrete/sfs	1.00 kN	2.66 kN
300421	single	42/260/80	stainless	concrete/sfs	0.92 kN	2.85 kN
300422	single	42/280/80	stainless	concrete/sfs	0.87 kN	2.85 kN
300423	single	42/300/80	stainless	concrete/sfs	0.79 kN	2.85 kN
300424	single	42/320/80	stainless	concrete/sfs	0.74 kN	2.85 kN
300428	double	42/60/160	stainless	concrete/sfs	11.99 kN	6.44 kN
300429	double	42/80/160	stainless	concrete/sfs	10.55 kN	6.44 kN
300430	double	42/100/160	stainless	concrete/sfs	8.27 kN	6.44 kN
300431	double	42/120/160	stainless	concrete/sfs	6.67 kN	6.44 kN
300433	double	42/140/160	stainless	concrete/sfs	5.56 kN	6.44 kN
300434	double	42/160/160	stainless	concrete/sfs	4.77 kN	6.44 kN
300435	double	42/180/160	stainless	concrete/sfs	4.18 kN	6.44 kN
300436	double	42/200/160	stainless	concrete/sfs	3.60 kN	6.44 kN
300437	double	42/220/160	stainless	concrete/sfs	3.34 kN	6.38 kN
300438	double	42/240/160	stainless	concrete/sfs	3.03 kN	6.38 kN
300440	double	42/260/160	stainless	concrete/sfs	2.76 kN	6.38 kN
300441	double	42/280/160	stainless	concrete/sfs	2.59 kN	6.38 kN
300442	double	42/300/160	stainless	concrete/sfs	2.41 kN	6.38 kN
300443	double	42/320/160	stainless	concrete/sfs	2.23 kN	6.38 kN

EVT- L-Brackets, Stainless Steel
Fixed Point Bracket









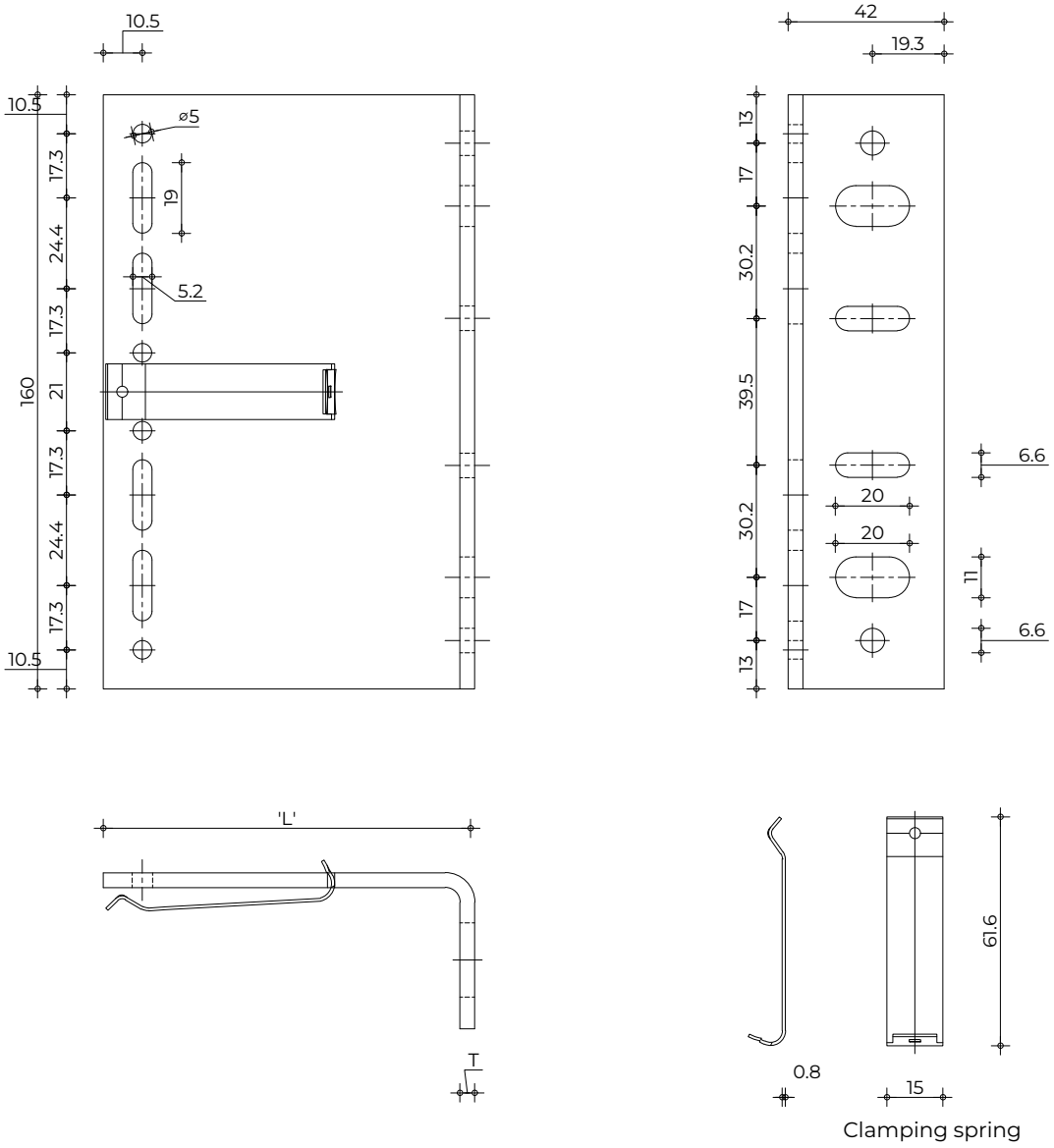
Clamping spring

L-Bracket Single
Suitable for Concrete, Masonry, Steel and Timber
*Custom lengths available on demand

Item	Material
L-Bracket	Aluminum - EN AW 5083-'O'-H111/4017-H32
	St. steel 1.4301/1.4401/1.4404
Clip	Stainless steel

L* =		T =
40mm	220mm	3 - 4 mm
60mm	240mm	
80mm	260mm	
100mm	280mm	
120mm	300mm	
160mm	320mm	
180mm	340mm	
200mm	360mm	

EVT- L-Brackets, Stainless Steel
Fixed Point Bracket



L-Bracket Double,
Suitable for Concrete, Masonry, Steel and Timber
*Custom lengths available on demand

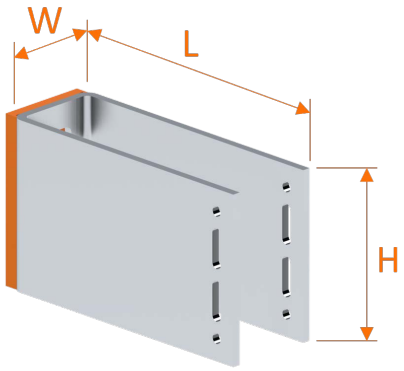
Item	Material
L-Bracket	Aluminum - EN AW 5083-'O'-H111/4017-H32
	St. steel 1.4301/1.4401/1.4404
Clip	Stainless steel

L* =		T =
40mm	220mm	3 - 4 mm
60mm	240mm	
80mm	260mm	
100mm	280mm	
120mm	300mm	
160mm	320mm	
180mm	340mm	
200mm	360mm	

EVT U Brackets - Aluminium FPH & SPH, slots for Concrete and SFS Brackets

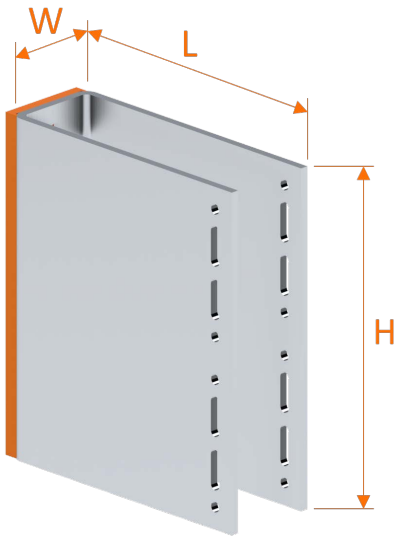
Fixing brackets					Suitable Thermo pads
Code	Type	H (mm)	W (mm)	L (mm)	Type
300496	single	80	44	60	515873 single
300497	single	80	44	80	
300498	single	80	44	100	
300499	single	80	44	120	
300500	single	80	44	140	
300501	single	80	44	160	
300502	single	80	44	180	
300503	single	80	44	200	
300504	single	80	44	220	
300505	single	80	44	240	
300506	single	80	44	260	
300507	single	80	44	280	
300508	single	80	44	300	
300509	single	80	44	320	

Single fixing



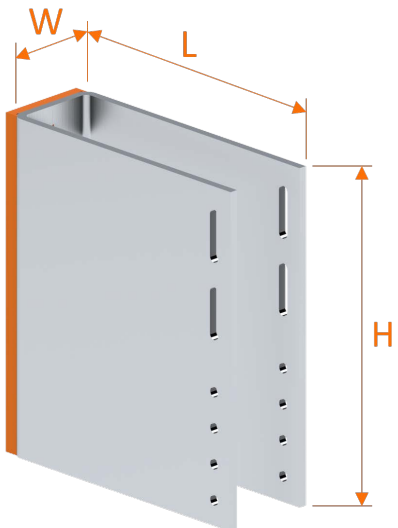
Fixing brackets					Suitable Thermo pads
Code	Type	H (mm)	W (mm)	L (mm)	Type
300479	double	160	44	60	535529 double
300480	double	160	44	80	
300481	double	160	44	100	
300482	double	160	44	120	
300483	double	160	44	140	
300484	double	160	44	160	
300485	double	160	44	180	
300486	double	160	44	200	
300487	double	160	44	220	
300488	double	160	44	240	
300489	double	160	44	260	
300490	double	160	44	280	
300491	double	160	44	300	
300492	double	160	44	320	

Double fixing bracket A



Fixing brackets					Suitable Thermo pads
Code	Type	H (mm)	W (mm)	L (mm)	Type
300513	combi	160	44	60	535529 double
300514	combi	160	44	80	
300515	combi	160	44	100	
300516	combi	160	44	120	
300517	combi	160	44	140	
300518	combi	160	44	160	
300519	combi	160	44	180	
300520	combi	160	44	200	
300521	combi	160	44	220	
300522	combi	160	44	240	
300523	combi	160	44	260	
300524	combi	160	44	280	
300525	combi	160	44	300	
300526	combi	160	44	320	

Double fixing bracket B

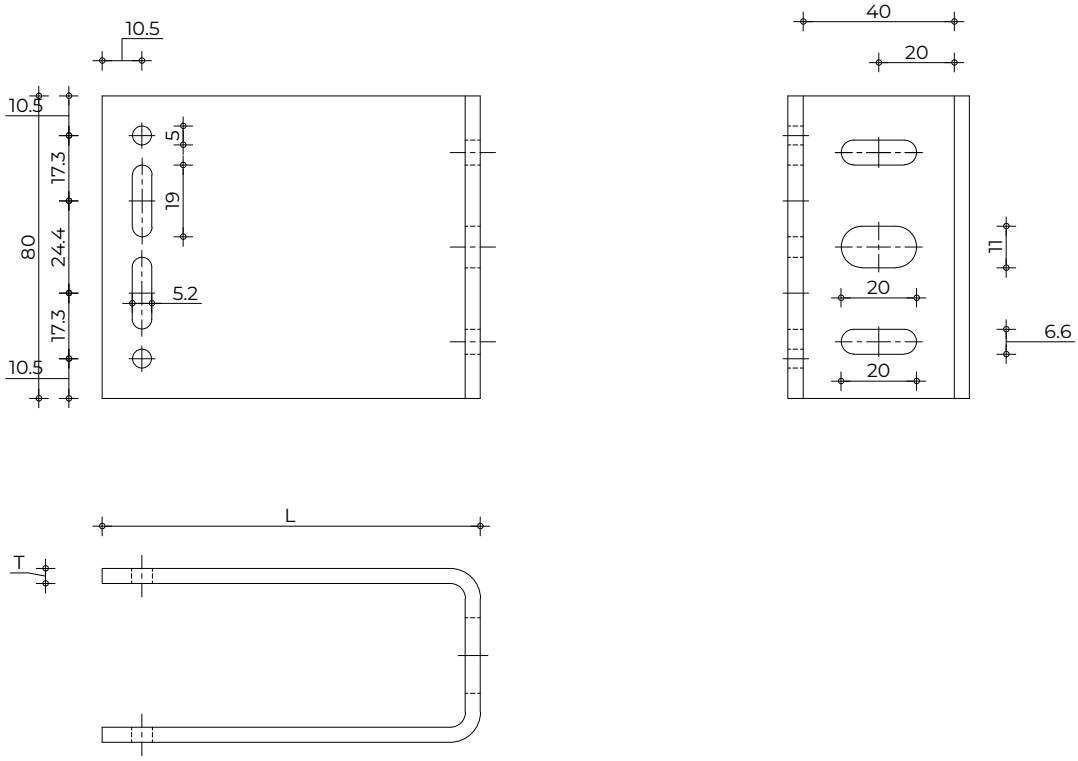


EVT U-Brackets, Aluminium Performance Table

Summary of results from testing of EVT U-brackets, Aluminium Code

Code	Type	Size(mm)	Material	Base	Design Resistance (kN)	
					Vertical	Horizontal
300496	single	44/60/80	aluminium	concrete/sfs	3.13 kN	2.41 kN
300497	single	44/80/80	aluminium	concrete/sfs	2.24 kN	2.40 kN
300498	single	44/100/80	aluminium	concrete/sfs	1.74 kN	2.40 kN
300499	single	44/120/80	aluminium	concrete/sfs	1.42 kN	2.40 kN
300500	single	44/140/80	aluminium	concrete/sfs	1.20 kN	2.39 kN
300501	single	44/160/80	aluminium	concrete/sfs	1.05 kN	2.40 kN
300502	single	44/180/80	aluminium	concrete/sfs	0.92 kN	2.40 kN
300503	single	44/200/80	aluminium	concrete/sfs	0.82 kN	2.40 kN
300504	single	44/220/80	aluminium	concrete/sfs	0.74 kN	2.41 kN
300505	single	44/240/80	aluminium	concrete/sfs	0.68 kN	2.41 kN
300506	single	44/260/80	aluminium	concrete/sfs	0.62 kN	2.39 kN
300507	single	44/280/80	aluminium	concrete/sfs	0.58 kN	2.39 kN
300508	single	44/300/80	aluminium	concrete/sfs	0.54 kN	2.40 kN
300509	single	44/320/80	aluminium	concrete/sfs	0.50 kN	2.40 kN
300479	double	44/60/160	aluminium	concrete/sfs	13.22 kN	6.97 kN
300480	double	44/80/160	aluminium	concrete/sfs	9.53 kN	6.97 kN
300481	double	44/100/160	aluminium	concrete/sfs	7.49 kN	6.97 kN
300482	double	44/120/160	aluminium	concrete/sfs	6.19 kN	6.97 kN
300483	double	44/140/160	aluminium	concrete/sfs	5.28 kN	6.97 kN
300484	double	44/160/160	aluminium	concrete/sfs	4.62 kN	6.97 kN
300485	double	44/180/160	aluminium	concrete/sfs	4.09 kN	6.97 kN
300486	double	44/200/160	aluminium	concrete/sfs	3.67 kN	6.90 kN
300487	double	44/220/160	aluminium	concrete/sfs	3.32 kN	7.01 kN
300488	double	44/240/160	aluminium	concrete/sfs	3.05 kN	7.01 kN
300489	double	44/260/160	aluminium	concrete/sfs	2.76 kN	7.01 kN
300490	double	44/280/160	aluminium	concrete/sfs	2.55 kN	7.08 kN
300491	double	44/300/160	aluminium	concrete/sfs	2.41 kN	7.04 kN
300492	double	44/320/160	aluminium	concrete/sfs	2.23 kN	7.04 kN
300513	double/combi	44/60/160	aluminium	concrete/sfs	13.22 kN	6.97 kN
300514	double/combi	44/80/160	aluminium	concrete/sfs	9.53 kN	6.97 kN
300515	double/combi	44/100/160	aluminium	concrete/sfs	7.49 kN	6.97 kN
300516	double/combi	44/120/160	aluminium	concrete/sfs	6.19 kN	6.97 kN
300517	double/combi	44/140/160	aluminium	concrete/sfs	5.28 kN	6.97 kN
300518	double/combi	44/160/160	aluminium	concrete/sfs	4.62 kN	6.97 kN
300519	double/combi	44/180/160	aluminium	concrete/sfs	4.09 kN	6.97 kN
300520	double/combi	44/200/160	aluminium	concrete/sfs	3.67 kN	6.90 kN
300521	double/combi	44/220/160	aluminium	concrete/sfs	3.32 kN	7.01 kN
300522	double/combi	44/240/160	aluminium	concrete/sfs	3.05 kN	7.01 kN
300523	double/combi	44/260/160	aluminium	concrete/sfs	2.76 kN	7.01 kN
300524	double/combi	44/280/160	aluminium	concrete/sfs	2.55 kN	7.08 kN
300525	double/combi	44/300/160	aluminium	concrete/sfs	2.41 kN	7.04 kN
300526	double/combi	44/320/160	aluminium	concrete/sfs	2.23 kN	7.04kN

EVT - U-Brackets, Aluminium
Sliding Point Bracket

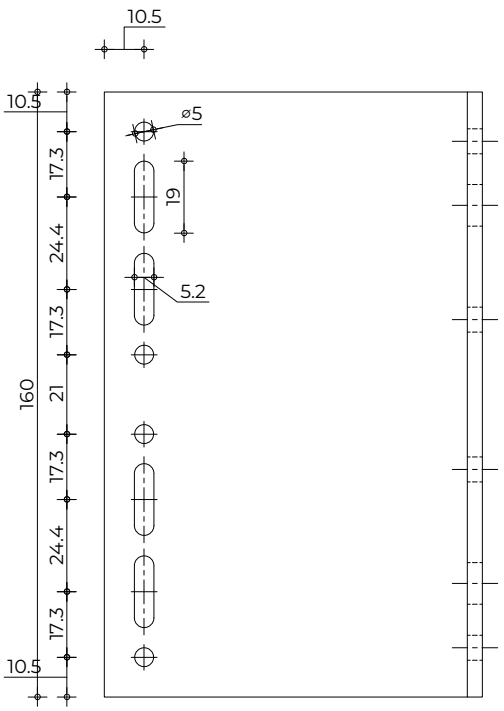


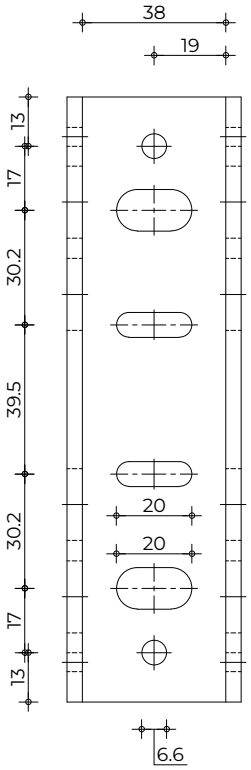
U-Bracket Single
Suitable for Concrete, Masonry, Steel and Timber
*Custom lengths available on demand

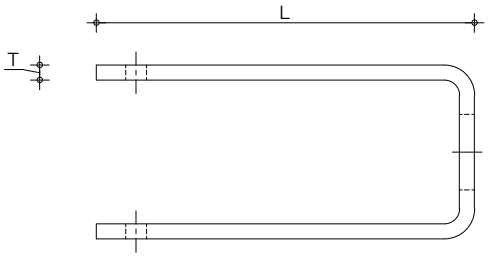
Item	Material
U-Bracket	Aluminum - EN AW 5083-'O'-H111/4017-H32
	St. steel 1.4301/1.4401/1.4404

L* =		T =
40mm	220mm	3 - 4 mm
60mm	240mm	
80mm	260mm	
100mm	280mm	
120mm	300mm	
160mm	320mm	
180mm	340mm	
200mm	360mm	

EVT - U-Brackets, Aluminium
Fixed Point Bracket





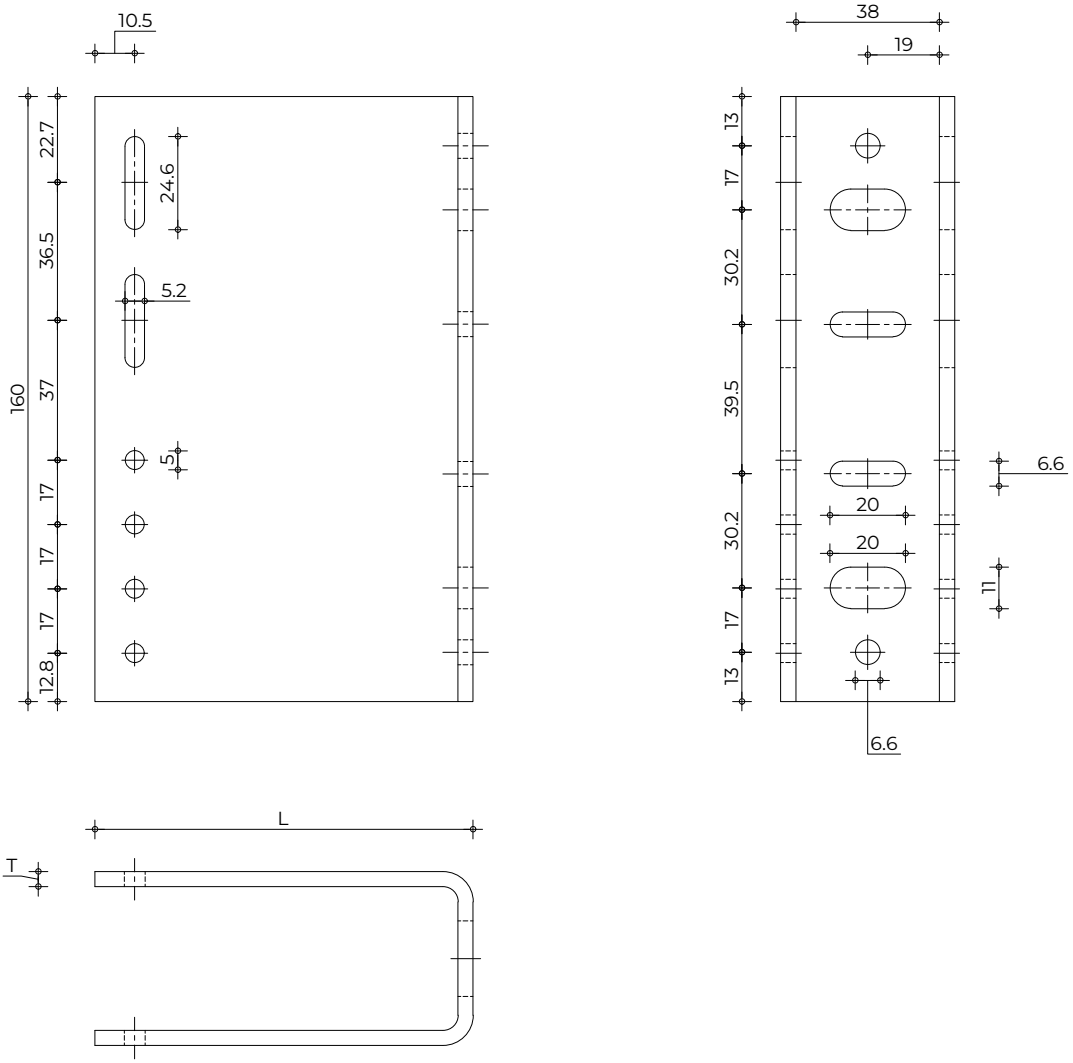


U-Bracket Double
Suitable for Concrete, Masonry, Steel and Timber
*Custom lengths available on demand

Item	Material
U-Bracket	Aluminum - EN AW 5083-'O'-H111/4017-H32
	St. steel 1.4301/1.4401/1.4404

L* =		T =
40mm	220mm	3 - 4 mm
60mm	240mm	
80mm	260mm	
100mm	280mm	
120mm	300mm	
160mm	320mm	
180mm	340mm	
200mm	360mm	

EVT- Combi U-Brackets, Aluminium
Fixed/ Sliding Point Bracket



Combi U-Bracket Fixed/Single
Suitable for Concrete, Masonry, Steel and Timber
*Custom lengths available on demand

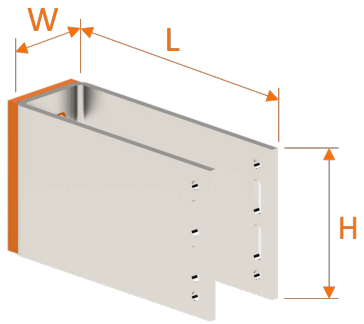
Item	Material
U-Bracket	Aluminum - EN AW 5083-'O'-H111/4017-H32
	St. steel 1.4301/1.4401/1.4404

L* =		T =
40mm	220mm	3 - 4 mm
60mm	240mm	
80mm	260mm	
100mm	280mm	
120mm	300mm	
160mm	320mm	
180mm	340mm	
200mm	360mm	

EVT U-Brackets - Stainless Steel FPH & SPH, slots for Concrete and Steel

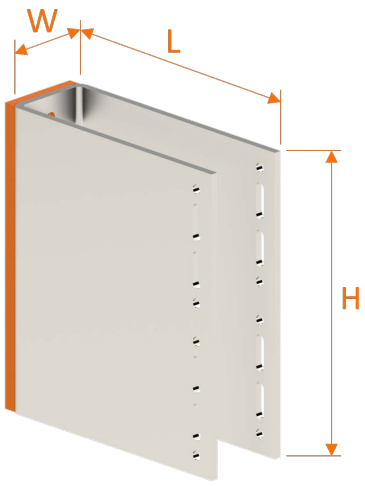
Fixing brackets					Suitable Thermo pads
Code	Type	H (mm)	W (mm)	L (mm)	Type
300530	single	80	44	60	515873 single
300531	single	80	44	80	
300532	single	80	44	100	
300533	single	80	44	120	
300534	single	80	44	140	
300535	single	80	44	160	
300536	single	80	44	180	
300537	single	80	44	200	
300538	single	80	44	220	
300539	single	80	44	240	
300540	single	80	44	260	
300541	single	80	44	280	
300542	single	80	44	300	
300543	single	80	44	320	

Single fixing



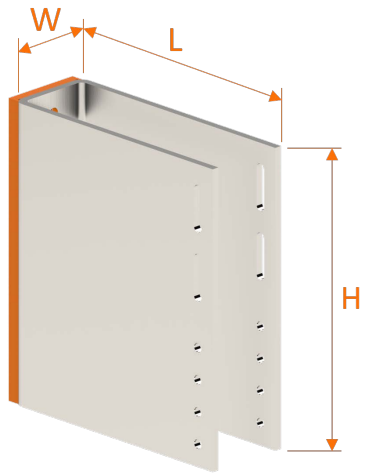
Fixing brackets					Suitable Thermo pads
Code	Type	H (mm)	W (mm)	L (mm)	Type
300547	double	160	44	60	535529 double
300548	double	160	44	80	
300549	double	160	44	100	
300550	double	160	44	120	
300551	double	160	44	140	
300552	double	160	44	160	
300553	double	160	44	180	
300554	double	160	44	200	
300555	double	160	44	220	
300556	double	160	44	240	
300557	double	160	44	260	
300558	double	160	44	280	
300559	double	160	44	300	
300560	double	160	44	320	

Double fixing bracket A



Fixing brackets					Suitable Thermo pads
Code	Type	H (mm)	W (mm)	L (mm)	Type
300564	combi	160	44	60	535529 double
300565	combi	160	44	80	
300566	combi	160	44	100	
300567	combi	160	44	120	
300568	combi	160	44	140	
300569	combi	160	44	160	
300570	combi	160	44	180	
300571	combi	160	44	200	
300572	combi	160	44	220	
300573	combi	160	44	240	
300574	combi	160	44	260	
300575	combi	160	44	280	
300576	combi	160	44	300	
300577	combi	160	44	320	

Double fixing bracket B

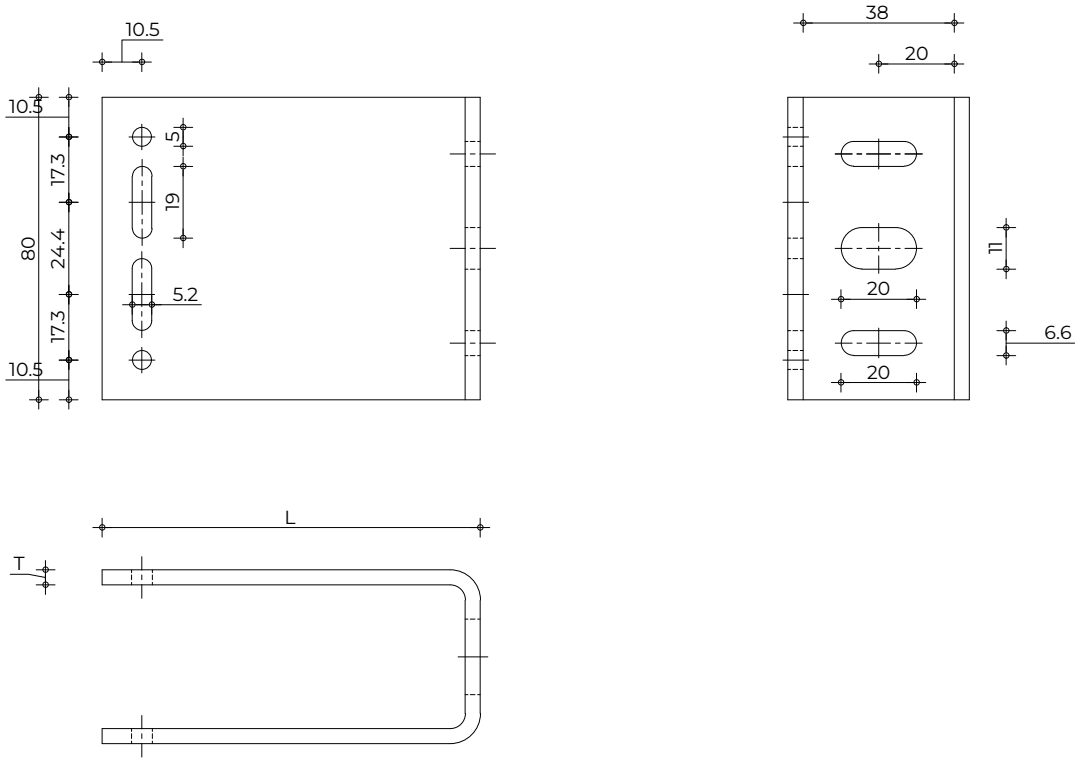


EVT U-Brackets, Aluminium Performance Table

Summary of results from testing of EVT U-brackets, Stainless

Code	Type	Size(mm)	Material	Base	Design Resistance (kN)	
					Vertical	Horizontal
300530	single	44/60/80	stainless	concrete/sfs	3.13 kN	2.41 kN
300531	single	44/80/80	stainless	concrete/sfs	2.24 kN	2.40 kN
300532	single	44/100/80	stainless	concrete/sfs	1.74 kN	2.40 kN
300533	single	44/120/80	stainless	concrete/sfs	1.42 kN	2.40 kN
300534	single	44/140/80	stainless	concrete/sfs	1.20 kN	2.39 kN
300535	single	44/160/80	stainless	concrete/sfs	1.05 kN	2.40 kN
300536	single	44/180/80	stainless	concrete/sfs	0.92 kN	2.40 kN
300537	single	44/200/80	stainless	concrete/sfs	0.82 kN	2.40 kN
300538	single	44/220/80	stainless	concrete/sfs	0.74 kN	2.41 kN
300539	single	44/240/80	stainless	concrete/sfs	0.68 kN	2.41 kN
300540	single	44/260/80	stainless	concrete/sfs	0.62 kN	2.39 kN
300541	single	44/280/80	stainless	concrete/sfs	0.58 kN	2.39 kN
300542	single	44/300/80	stainless	concrete/sfs	0.54 kN	2.40 kN
300543	single	44/320/80	stainless	concrete/sfs	0.50 kN	2.40 kN
300547	double	44/60/160	stainless	concrete/sfs	13.22 kN	6.97 kN
300548	double	44/80/160	stainless	concrete/sfs	9.53 kN	6.97 kN
300549	double	44/100/160	stainless	concrete/sfs	7.49 kN	6.97 kN
300550	double	44/120/160	stainless	concrete/sfs	6.19 kN	6.97 kN
300551	double	44/140/160	stainless	concrete/sfs	5.28 kN	6.97 kN
300552	double	44/160/160	stainless	concrete/sfs	4.62 kN	6.97 kN
300553	double	44/180/160	stainless	concrete/sfs	4.09 kN	6.97 kN
300554	double	44/200/160	stainless	concrete/sfs	3.67 kN	6.90 kN
300555	double	44/220/160	stainless	concrete/sfs	3.32 kN	7.01 kN
300556	double	44/240/160	stainless	concrete/sfs	3.05 kN	7.01 kN
300557	double	44/260/160	stainless	concrete/sfs	2.76 kN	7.01 kN
300558	double	44/280/160	stainless	concrete/sfs	2.55 kN	7.08 kN
300559	double	44/300/160	stainless	concrete/sfs	2.41 kN	7.04 kN
300560	double	44/320/160	stainless	concrete/sfs	2.23 kN	7.04 kN
300564	double/combi	44/60/160	stainless	concrete/sfs	13.22 kN	6.97 kN
300565	double/combi	44/80/160	stainless	concrete/sfs	9.53 kN	6.97 kN
300566	double/combi	44/100/160	stainless	concrete/sfs	7.49 kN	6.97 kN
300567	double/combi	44/120/160	stainless	concrete/sfs	6.19 kN	6.97 kN
300568	double/combi	44/140/160	stainless	concrete/sfs	5.28 kN	6.97 kN
300569	double/combi	44/160/160	stainless	concrete/sfs	4.62 kN	6.97 kN
300570	double/combi	44/180/160	stainless	concrete/sfs	4.09 kN	6.97 kN
300571	double/combi	44/200/160	stainless	concrete/sfs	3.67 kN	6.90 kN
300572	double/combi	44/220/160	stainless	concrete/sfs	3.32 kN	7.01 kN
300573	double/combi	44/240/160	stainless	concrete/sfs	3.05 kN	7.01 kN
300574	double/combi	44/260/160	stainless	concrete/sfs	2.76 kN	7.01 kN
300575	double/combi	44/280/160	stainless	concrete/sfs	2.55 kN	7.08 kN
300576	double/combi	44/300/160	stainless	concrete/sfs	2.41 kN	7.04 kN
300577	double/combi	44/320/160	stainless	concrete/sfs	2.23 kN	7.04 kN

EVT - U-Brackets, Stainless Steel
Fixed Point Bracket

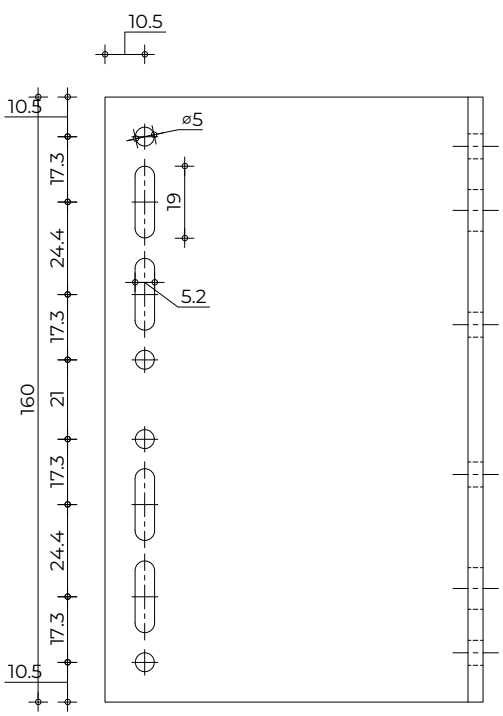


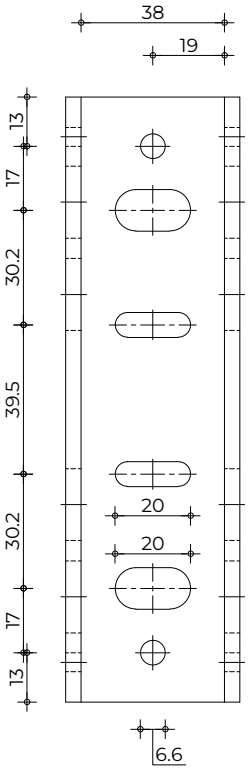
U-Bracket Single
Suitable for Concrete, Masonry, Steel and Timber
*Custom lengths available on demand

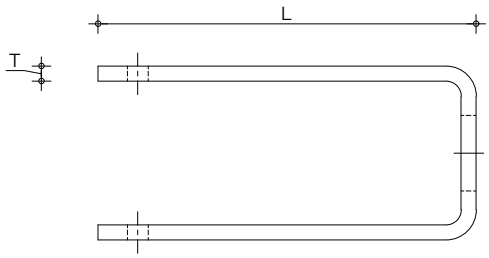
Item	Material
U-Bracket	Aluminum - EN AW 5083-'O'-H111/4017-H32
	St. steel 1.4301/1.4401/1.4404

L* =		T =
40mm	220mm	3 - 4 mm
60mm	240mm	
80mm	260mm	
100mm	280mm	
120mm	300mm	
160mm	320mm	
180mm	340mm	
200mm	360mm	

EVT - U-Brackets, Stainless Steel
Fixed Point Bracket





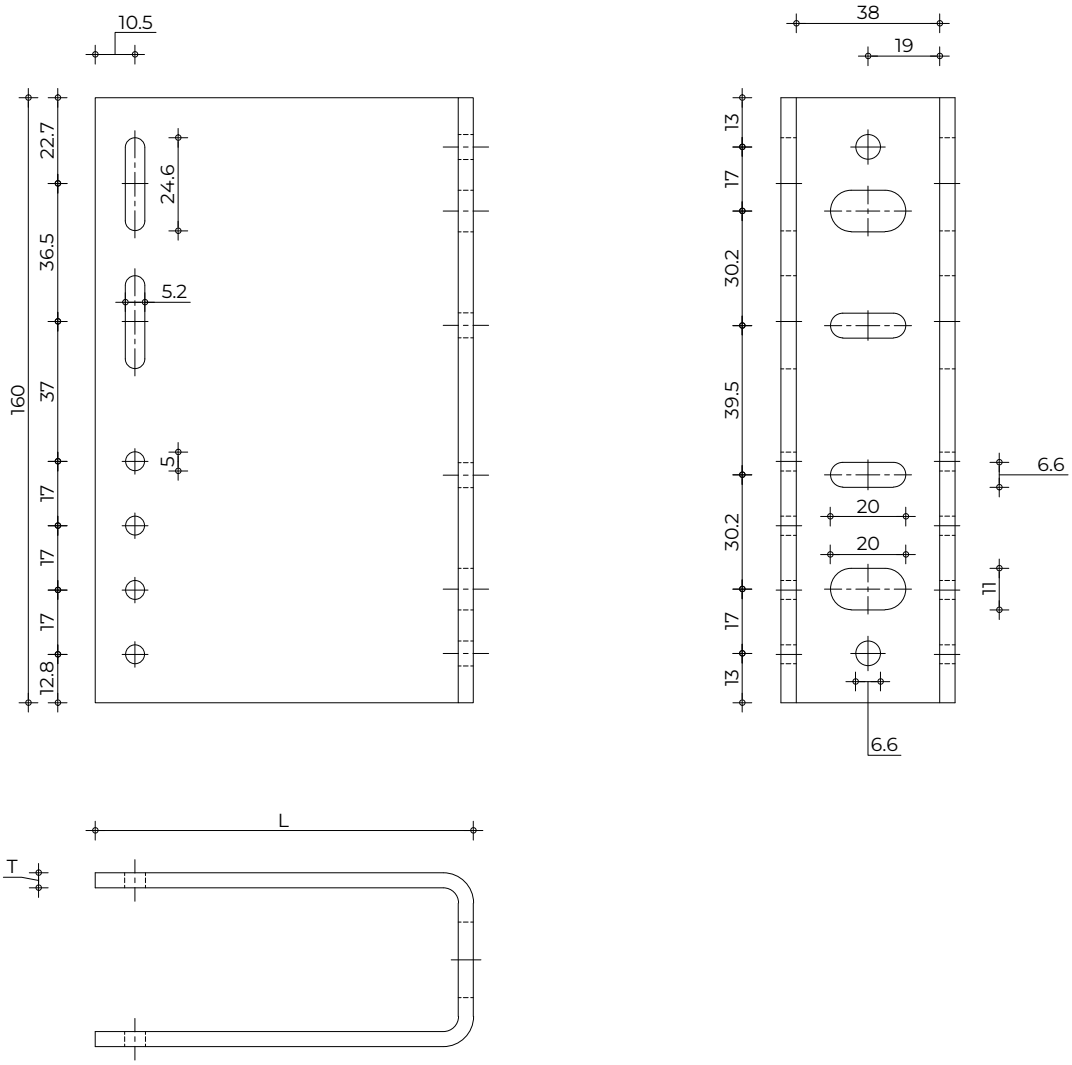


U-Bracket Double
Suitable for Concrete, Masonry, Steel and Timber
*Custom lengths available on demand

Item	Material
U-Bracket	Aluminum - EN AW 5083-'O'-H111/4017-H32
	St. steel 1.4301/1.4401/1.4404

L* =		T =
40mm	220mm	3 - 4 mm
60mm	240mm	
80mm	260mm	
100mm	280mm	
120mm	300mm	
160mm	320mm	
180mm	340mm	
200mm	360mm	

EVT- Combi U-Brackets, Stainless Steel
Fixed/ Sliding Point Bracket



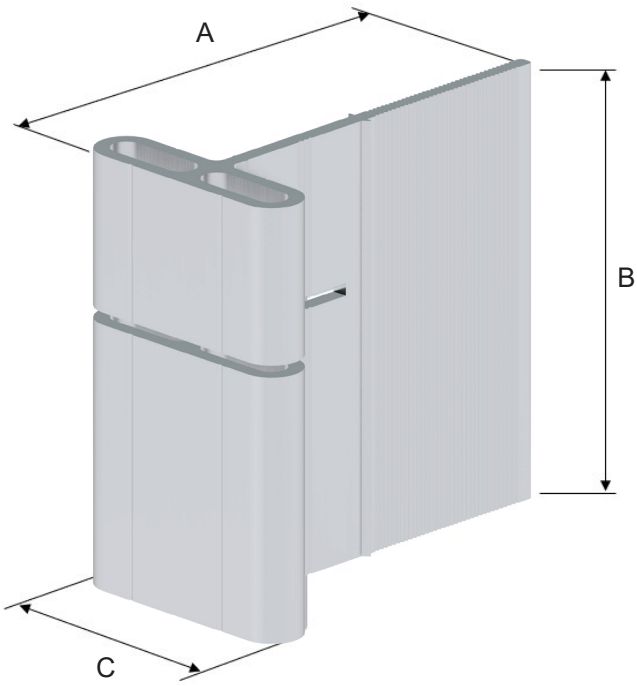
Combi U-Bracket Fixed/Single
Suitable for Concrete, Masonry, Steel and Timber
*Custom lengths available on demand

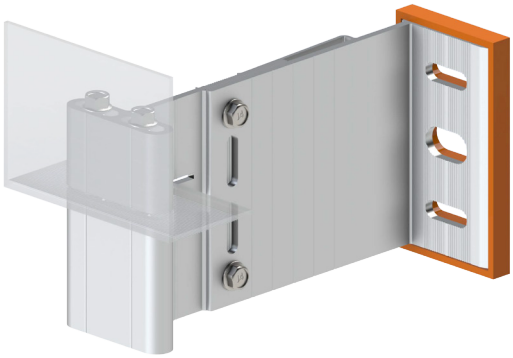
Item	Material
U-Bracket	Aluminum - EN AW 5083-'O'-H111/4017-H32
	St. steel 1.4301/1.4401/1.4404

L* =		T =
40mm	220mm	3 - 4 mm
60mm	240mm	
80mm	260mm	
100mm	280mm	
120mm	300mm	
160mm	320mm	
180mm	340mm	
200mm	360mm	

EVT II Horizontal Adaptor - Aluminium

Horizontal T adaptor			
Code	A (mm)	B (mm)	C (mm)
522161	86	80	47



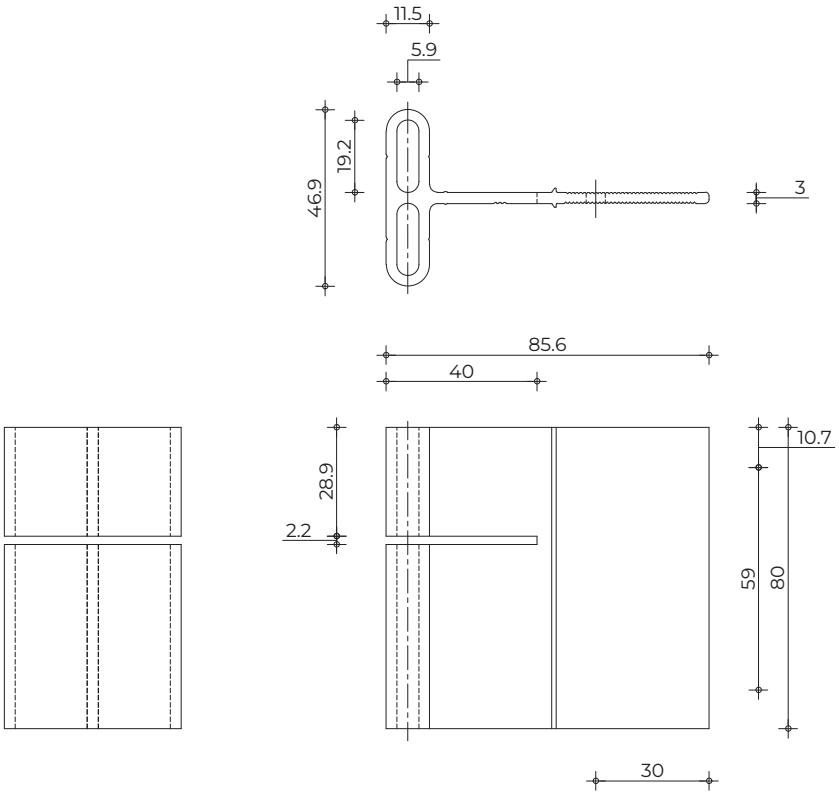


The performance characteristic of the horizontal T adapter has been tested in a laboratory condition for the worst-case scenario. The aim of the test is to determine the wind and dead load capacity of the brackets and their fixings to the subframe under shear and tension loads.

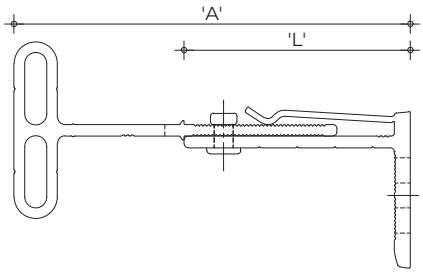
Code	Size (mm)	Material	Base	Design Resistance (kN) (1)	
				Vertical (kN)	Horizontal (kN)
522161	86x80x47	aluminium	sfs / concrete	1.92	2.81

(1) The adapter piece is designed to be attached to an EVT II L-Bracket. The design resistance of the helping hand bracket will be the limiting factor when assessing final suitability.

EVT II Horizontal Adaptor, Aluminium



L =	A =
40mm	85mm
60mm	105mm
80mm	125mm
100mm	145mm
120mm	165mm
140mm	185mm
160mm	205mm
180mm	225mm
200mm	245mm
220mm	265mm
240mm	285mm
260mm	305mm
280mm	325mm
300mm	345mm
320mm	365mm

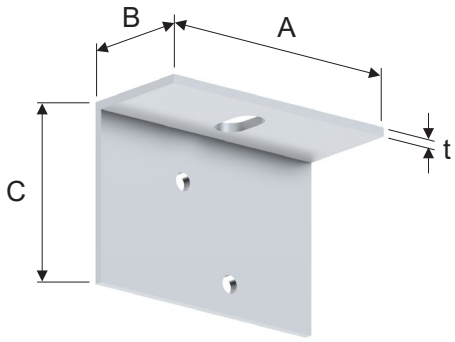


Item	Material
Horizontal T Adaptor Piece	Aluminum - EN AW 6063 T6

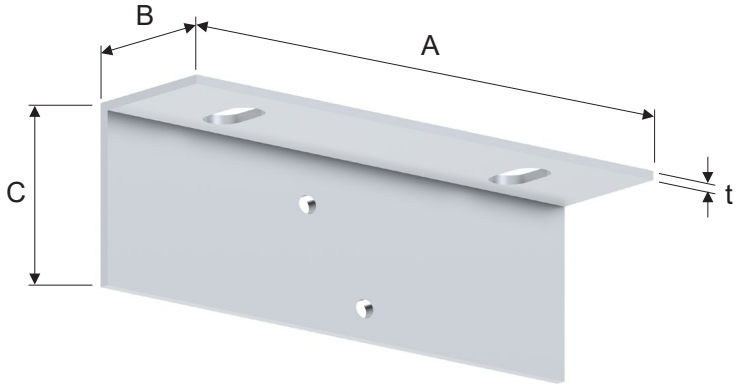
EVT II Soffit L Bracket

Soffit hanger brackets						Suitable Thermo pads
Code	Type	A (mm)	B (mm)	C (mm)	t (mm)	Type
553336	Double	160	40	60	2	130531
553337	Single	80	40	60	2	130530
553338	Double	160	40	60	3	130531
553339	Single	80	40	60	3	130530

Single fixing bracket



Double fixing bracket



The performance characteristics of the soffit hanger brackets are tested in laboratory conditions for the worstcase scenario. The aim of the test is to determine the dead load capacity of the brackets and their fixings to the subframe under tension loads.

Summary of results from testing of soffit hanger brackets, Aluminium

Code	Type	Size (mm)	Thickness (mm)	Material	Base	Design Resistance (kN)
						Vertical (kN)
553336	Double	160x40x60	2	aluminium	concrete	1.96
553337	Single	80x40x60	2	aluminium	concrete	1.18
553338	Double	160x40x60	3	aluminium	concrete	3.61
553339	Single	80x40x60	3	aluminium	concrete	2.22

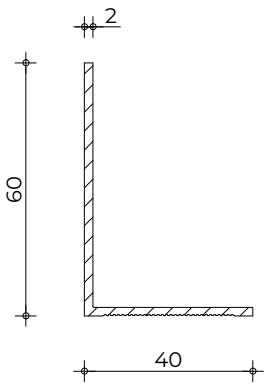
System Profiles & Structural Support Profiles

L, T, Floorspan Profiles

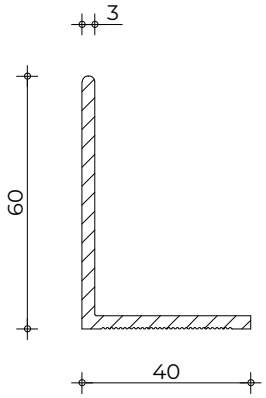
Structural C & Tophat Profiles

Zed & Hat Profiles

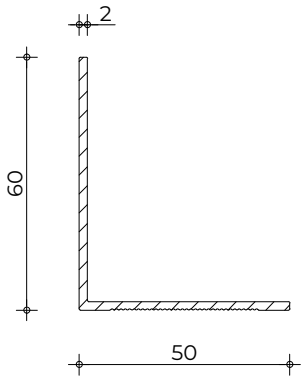
EVT II - L Profiles, Aluminium



L-Profile - 60x40x2



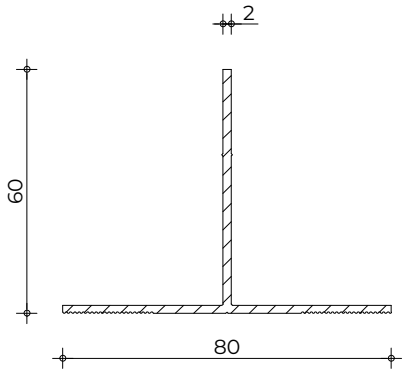
L-Profile - 60x40x3



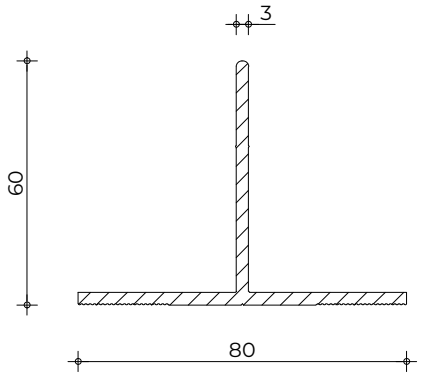
L-Profile - 60x50x2

Item	Material
L-Profile	Aluminum - EN AW 6063 T6

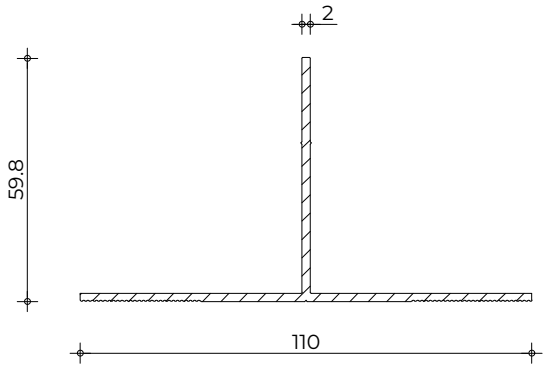
EVT II - T Profiles, Aluminium



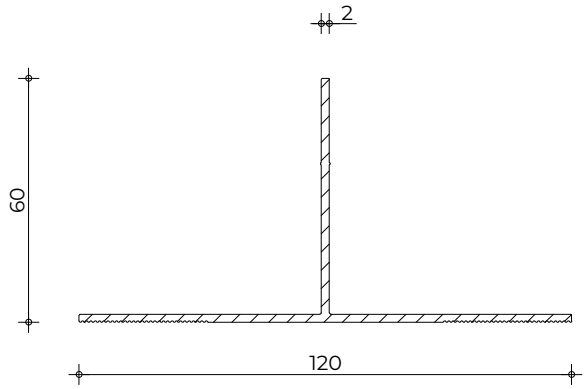
T-Profile - 80x60x2



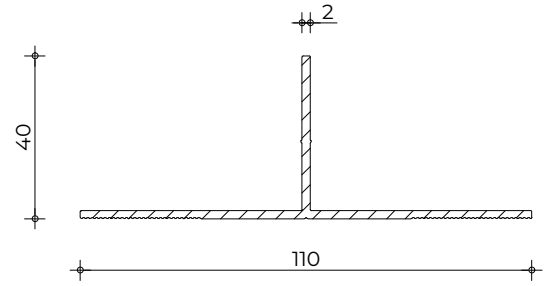
T-Profile - 80x60x3



T-Profile - 110x60x2



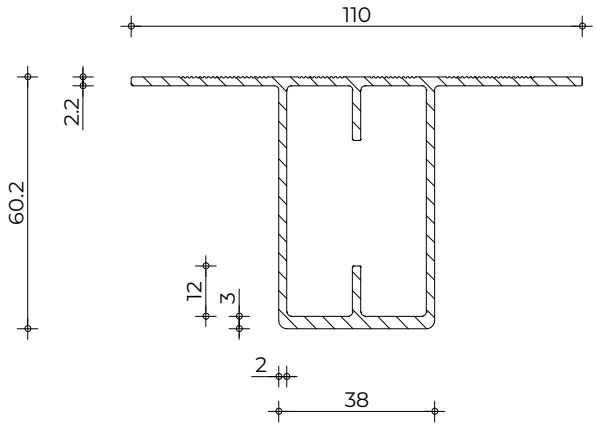
T-Profile - 120x60x2



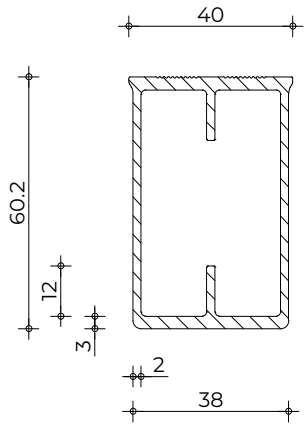
T-Profile - 110x40x2

Item	Material
T-Profile	Aluminum - EN AW 6063 T6

EVT II - Floorspan Profiles, Aluminium



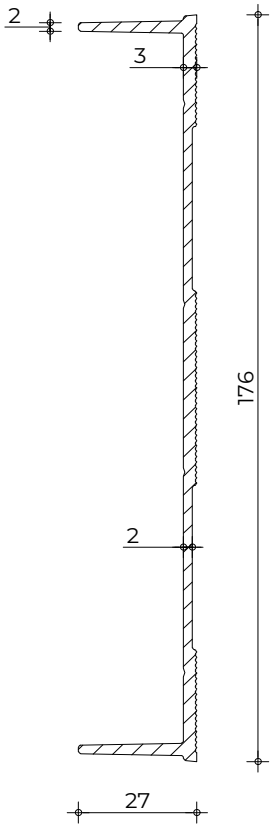
Floorspan T-Profile - 110/38 x 60 x 2/3



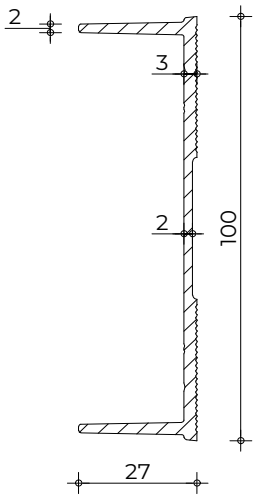
Floorspan Profile - 40/38 x 60 x 2/3

Item	Material
Box Sections	Aluminum - EN AW 6063 T6

EVT II - Structural C Channels, Aluminium



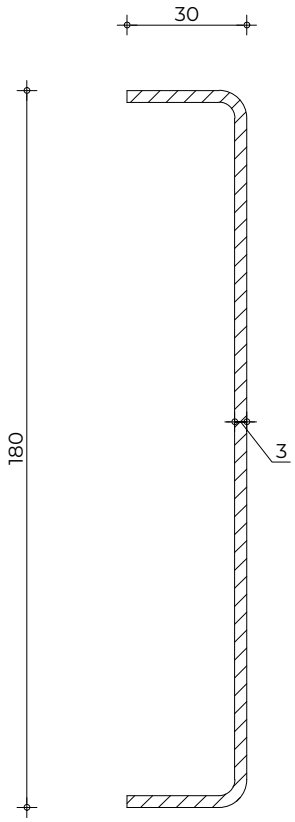
C-channel 176x27



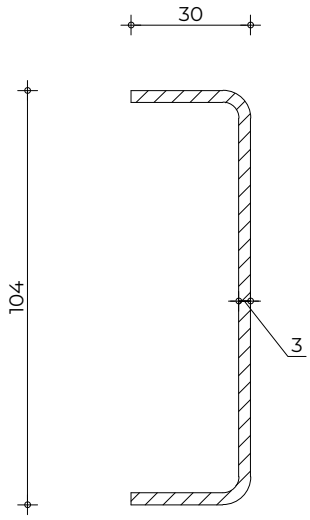
C-channel 100x27

Item	Material
C-Profiles	Aluminum - EN AW 6063 T6

EVT II - Structural C Channels, Stainles Steel



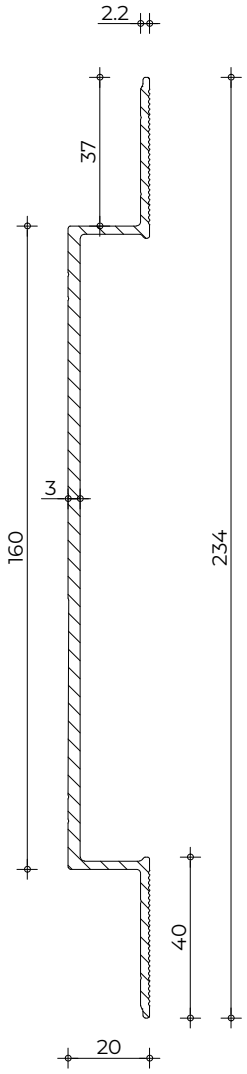
FPH C-Channel 180x30



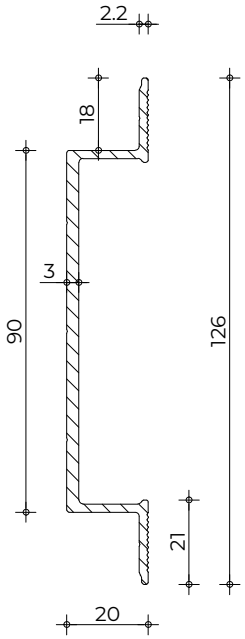
SPH Top Hat 104x30

Item	Material
C-Channel	St. steel 1.4301/1.4401/1.4404

EVT II - Structural Top Hat Profiles, Aluminium



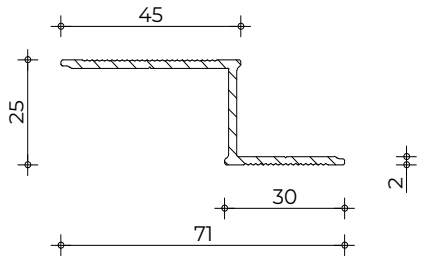
FPH Top Hat 234x20x160



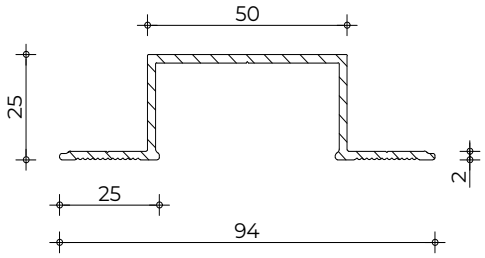
SPH Top Hat 126x20x90

Item	Material
Top Hat	Aluminum - EN AW 6063 T6

EVT II - Zed and Hat Profile, Aluminium



Zed Profile - 45x25x30x2



Hat Profile - 94x25x2

Item	Material
Hat Profile	Aluminum - EN AW 6063 T6
Zed Profile	Aluminum - EN AW 6063 T6

Facade Types

Bravo - Bravo W / Bravo H
Vario L / Vario F
Forte L / Forte / Forte P / Kerf /
Brickslip

Bravo

Bravo W / Bravo H

Bravo W

Bravo W is the optimal solution for large and flat façades, ensuring fast and secure installation of cassettes from aluminium composite materials and metal sheets. The system allows the movement of the façade material, due to various thermal expansions, without compromising the secure attachment of the cassettes.

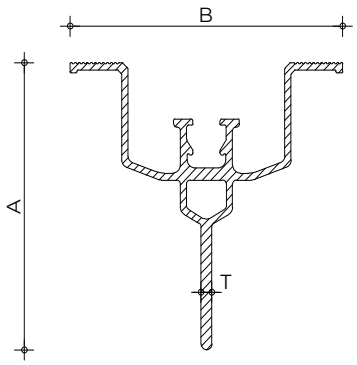
Main advantages:

- fast and secure installation
- hangers, allowing adjustment in three directions to facilitate the installation of the cassettes

Cladding Materials

- Aluminium Composite Material, Metal sheet products.

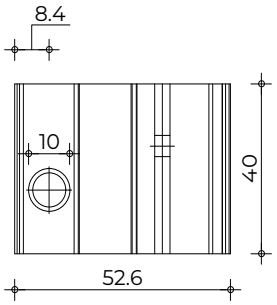
Bravo W - Profile, Aluminium

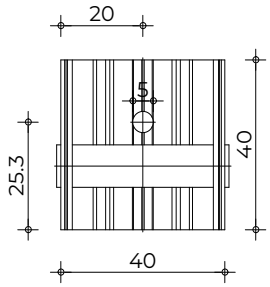


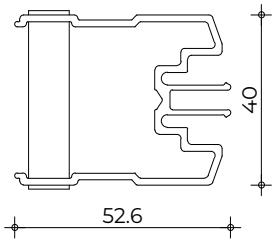
Item	Material
Profile	Aluminum - EN AW 6063 T6

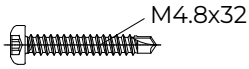
A =	B =	T =
70.4mm	70.6mm	2.8mm
100.4mm	70.6mm	2.8mm

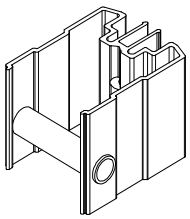
Bravo W - Brackets, Aluminium





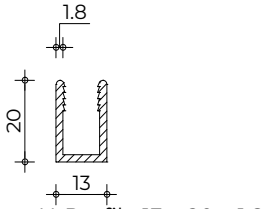




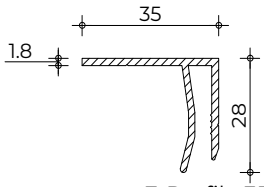


Item	Material
Hanger	Aluminum - EN AW 6063 T6

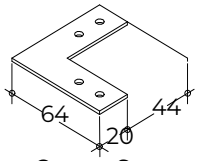
Bravo W - Supporting Profiles, Aluminium



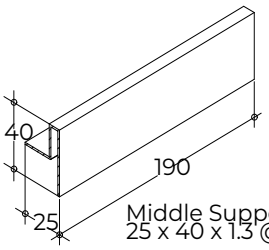
U-Profile 13 x 20 x 1.8



F-Profile 35 x 28 x 1.8



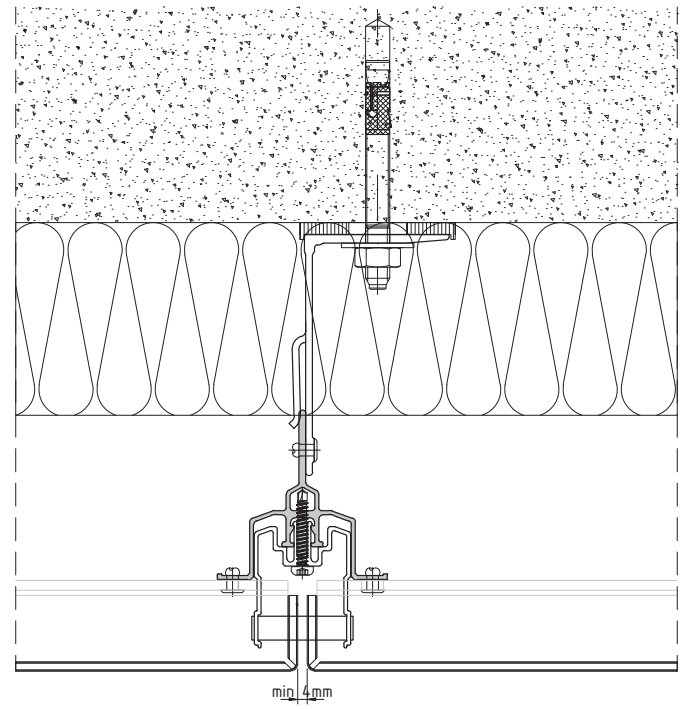
Corner Supporting Profile
64 x 64 x 2mm

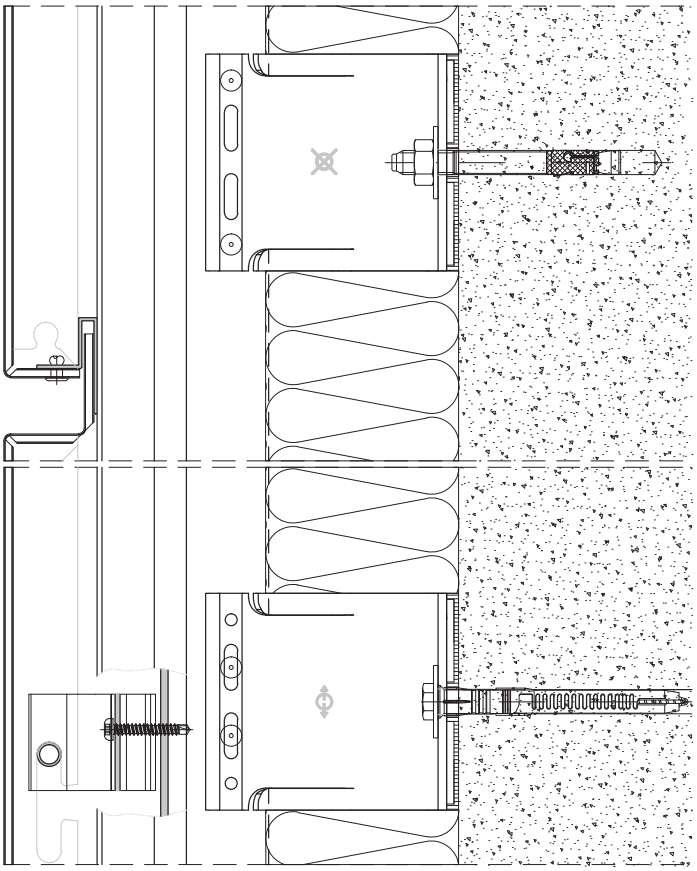


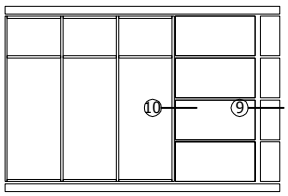
Middle Supporting Profile
25 x 40 x 1.3 @ 190

Item	Material
U-Profile	Aluminum - EN AW 6063 T6
F-Profile	Aluminum - EN AW 6063 T6
Mid. Supp. Profile	Aluminum - EN AW 6063 T6
Cor. Supp. Profile	Aluminum - EN AW 6063 T6

Bravo W







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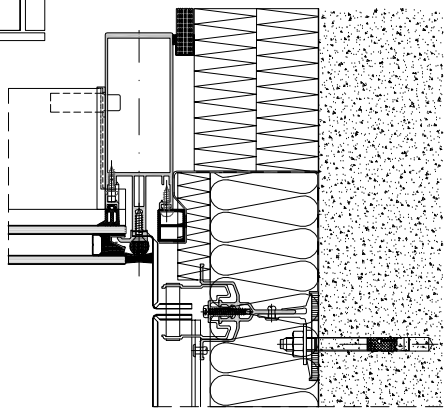

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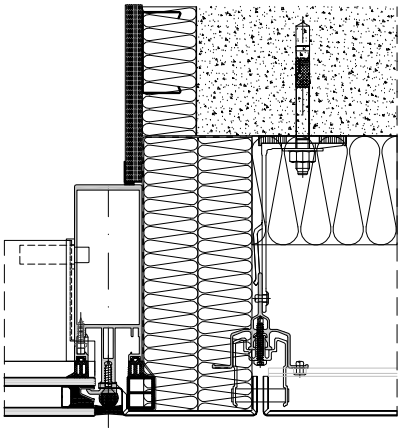

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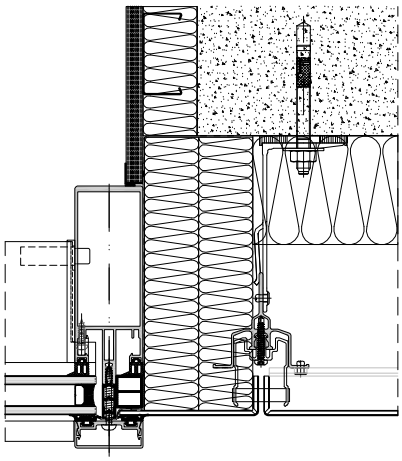


Bravo H

Bravo W is the optimal solution for large and flat façades, ensuring fast and secure installation of cassettes from aluminium composite materials and metal sheets. The system allows the movement of the façade material, due to various thermal expansions, without compromising the secure attachment of the cassettes.

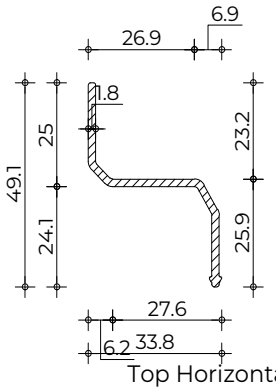
Main advantages:

- fast and secure installation
- widescreen raster on the façades can be manufactured
- special accessories to avoid the clatter noise between the horizontal profiles
- possibility for large span of the panels depending on the applied loads variable
- horizontal and vertical gap (min 4 – max 21 mm)

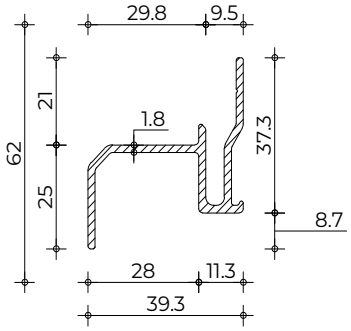
Cladding Materials

- Aluminium Composite Material, Metal sheet products.

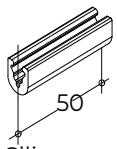
Bravo H - Support Profiles, Aluminium



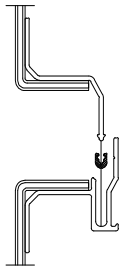
Top Horizontal Profile



Bottom Horizontal Profile



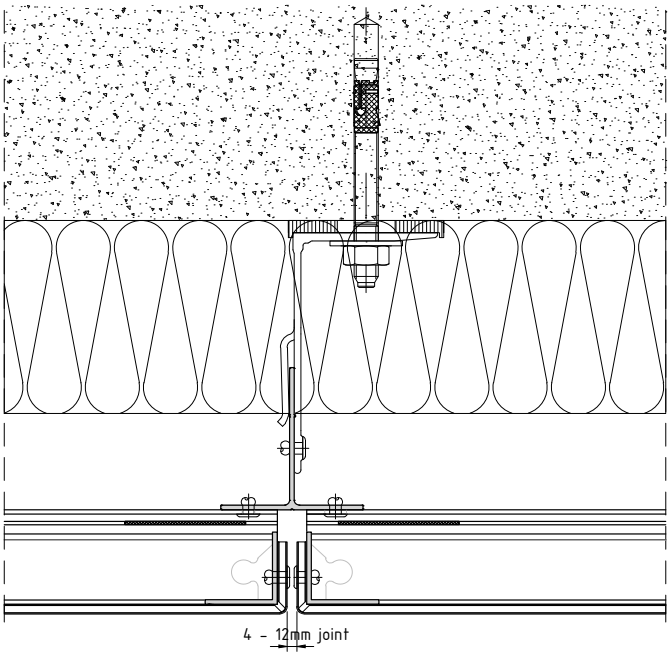
Silicone gasket - 50mm

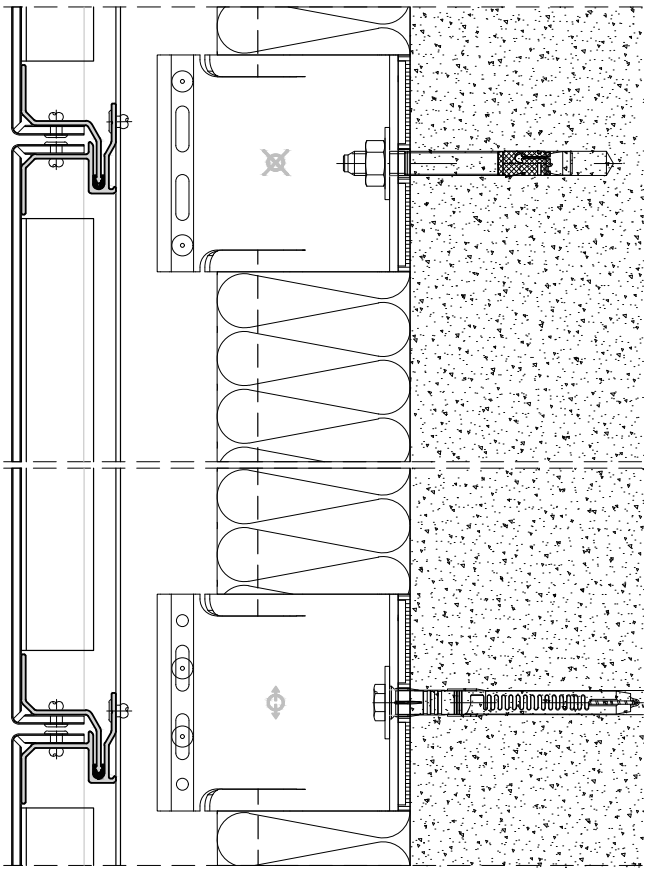


Profiles and gasket combination

Item	Material
Profiles	Aluminum - EN AW 6063 T6
Gasket	Silicone

Bravo H





Vario

Vario L / Vario F

Vario L

System for ventilated facade consisting entirely of extruded aluminium elements. Vario L differs from the existing solutions with the unique cladding material - aluminium lamella. The product ensures accurate fixed 8 mm vertical gap by specially selected main vertical profile and 8 mm horizontal negative gap, defined by the lamellas.

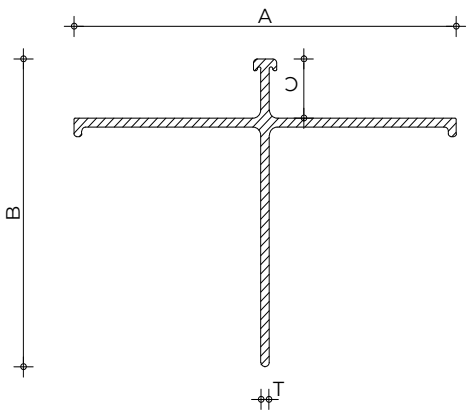
Main advantages:

- quick and easy installation due to only one main façade material without additional accessories
- custom made sizes of lamellas
- wide range of finishes and colors
- low weight of just 6 kg/m², facilitating the transportation, loading, unloading and installation
- allows the use of very long lamella, in the case of severe loading and provides excellent performance in terms of statics

Cladding Materials

- Aluminium Lamella.

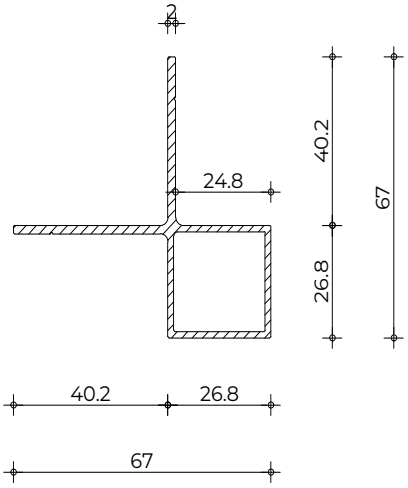
Vario L - Vertical Profile, Aluminium



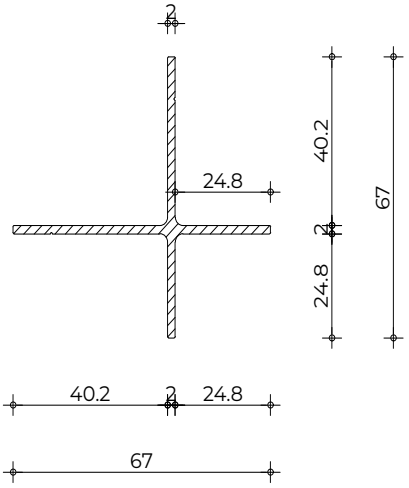
Item	Material
T-Profile	Aluminum - EN AW 6063 T6

A =	B =	C =	T =
99mm	75.8mm	14.6mm	2.2mm

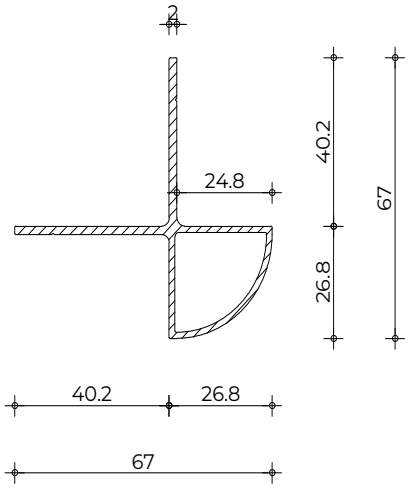
Vario L - Vertical Corner Profiles, Aluminium



Box-Profile 67 x 67 x 2



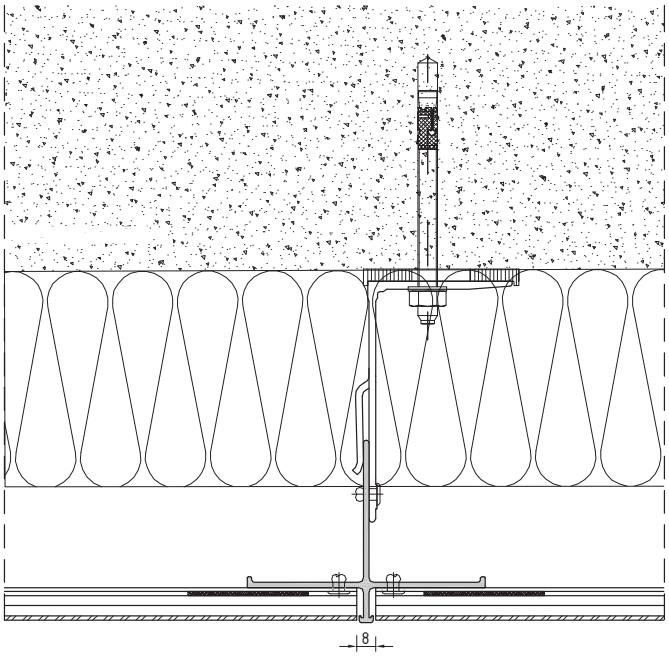
Cross-Profile 67 x 67 x 2

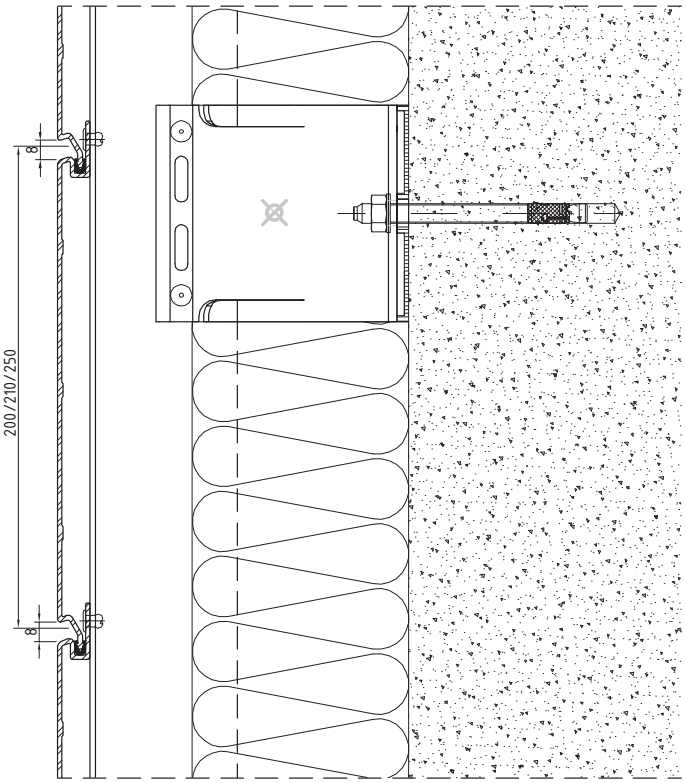


Round-Profile 67 x 67 x 2

Item	Material
Box Profile	Aluminum - EN AW 6063 T6
Cross Profile	Aluminum - EN AW 6063 T6
Round Profile	Aluminum - EN AW 6063 T6

Vario L





Vario F

The system is suitable for visible mounting of thin and smooth façade materials, by using rivets/screws.

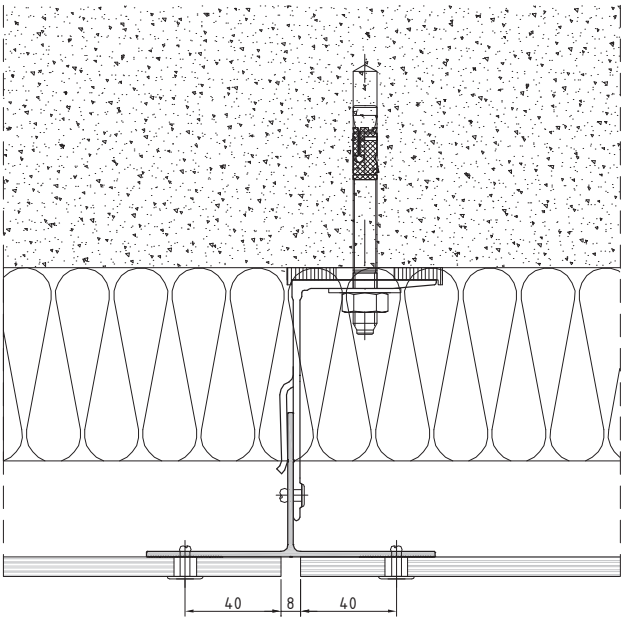
Main advantages:

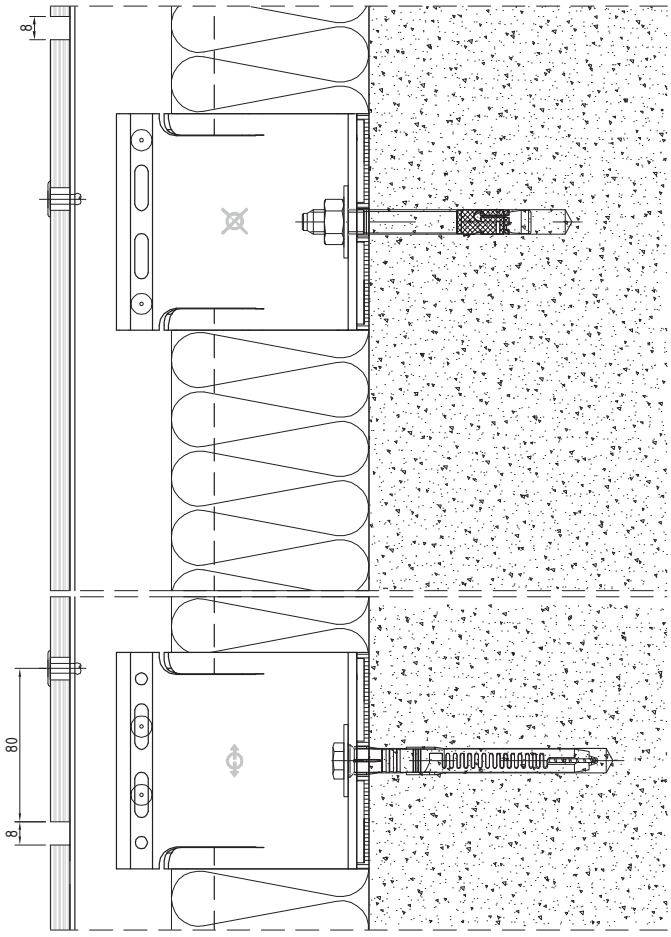
- quick installation of façade material with different sizes
- possibility to paint the visible fastening elements in a wide range of colours to match the façade material
- possible use of cladding materials with a thickness ranging from 4mm to 12mm

Cladding Materials

- Cement Board, High Pressure Laminates (HPL), Fibre Cement, Composite Mineral Material, Glass Fiber Reinforced Concrete GFRC, GREP, Light Transmitting Concrete

Vario F





Forte

Forte L / Forte / Forte P / Kerf / Brickslip

Forte L

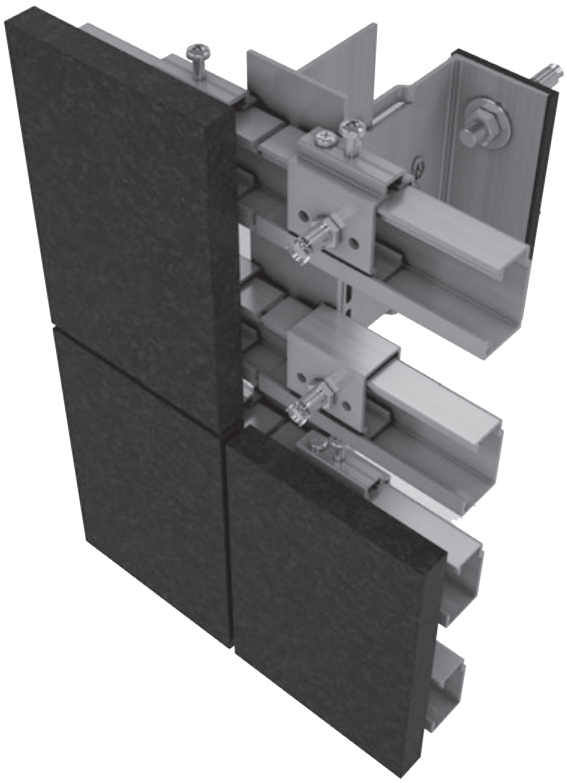
Forte L is designed for invisible mounting of thin and smooth façade materials through undercut anchors. The undercut anchors, system accessories, and designed profiles allow secure mounting of HPL, fibre cement, ceramics, and stone with less than 25 mm thickness. Forte Light Ventilated System uses fixing anchors to guarantee the connections between the façade material and the main profiles of the system..

Main advantages:

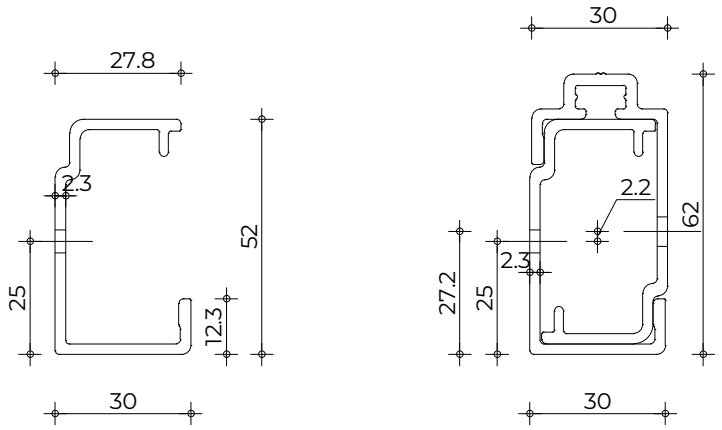
- perfect vision of the façade with no visible holding elements; large variety of sizes and designs of the façade materials
- highest level of security when fixing the tiles, due to the undercut anchors
- possibility to use façade materials with thickness ranging from 10mm to 25mm
- fast and easy installation - 1.5 sq.m. per person per hour
- secure and fully engineered work, which covers the entire project, and guarantees a complete system solution

Cladding Materials

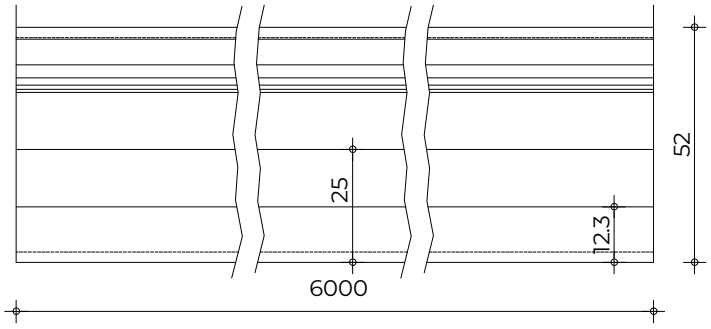
- Ceramic Tiles, Glass, High Pressure Laminates (HPL), Fibre Cement, Stone, Technical Stone, Composite Mineral Material, Glass Fiber Reinforced Concrete GFRC, GREP, Light Transmitting Concrete



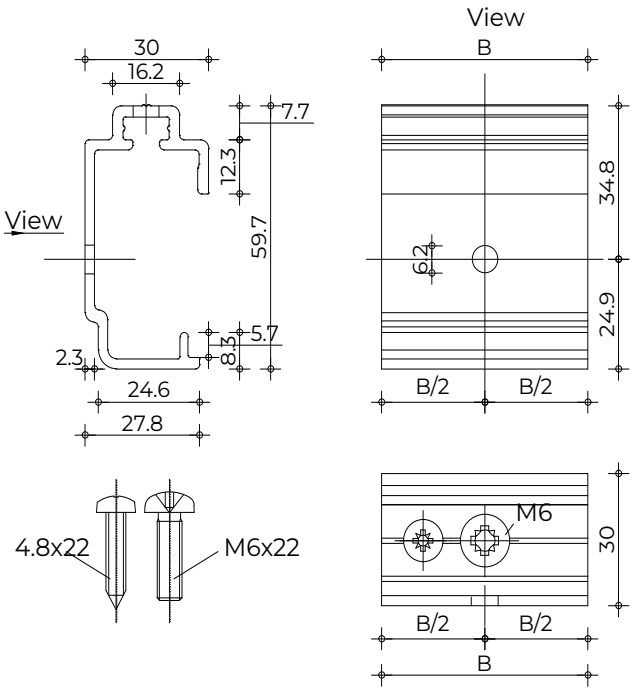
Forte L - Aluminium, Horizontal Support Profile

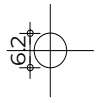


Horizontal profile

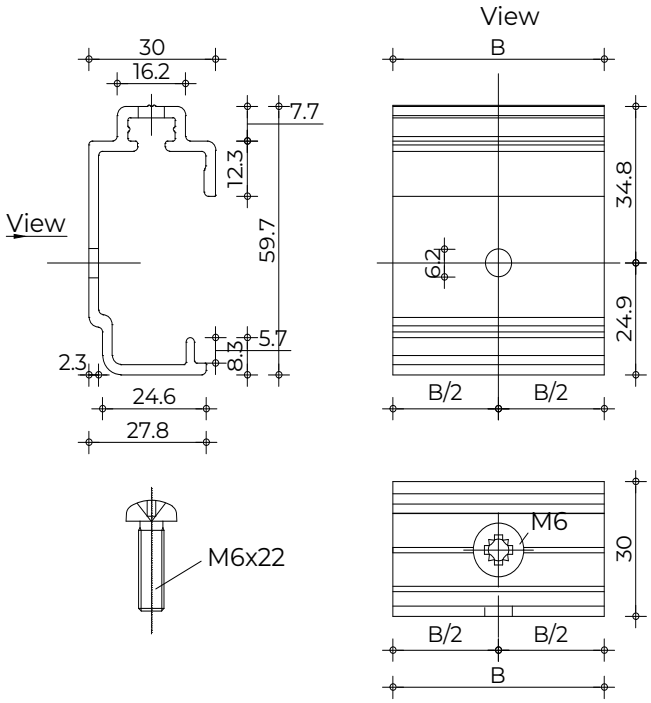


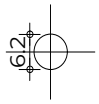
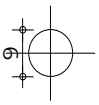
Forte L - Aluminium, Hanger Adjustable for Fixed Support



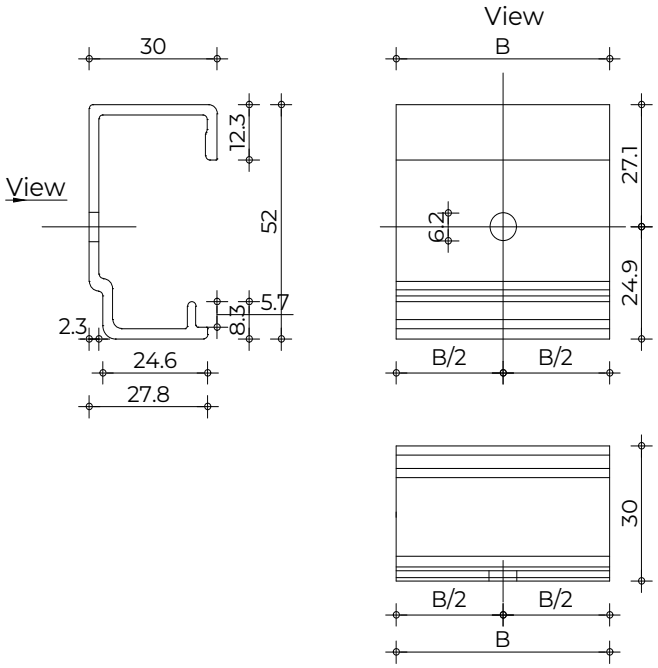
Application	hole type	B =
Fischer FZP/M6		60 mm
Fischer FZP/M8		

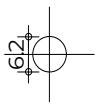
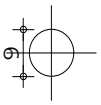
Forte L - Aluminium, Hanger Adjustable for Flexible Support



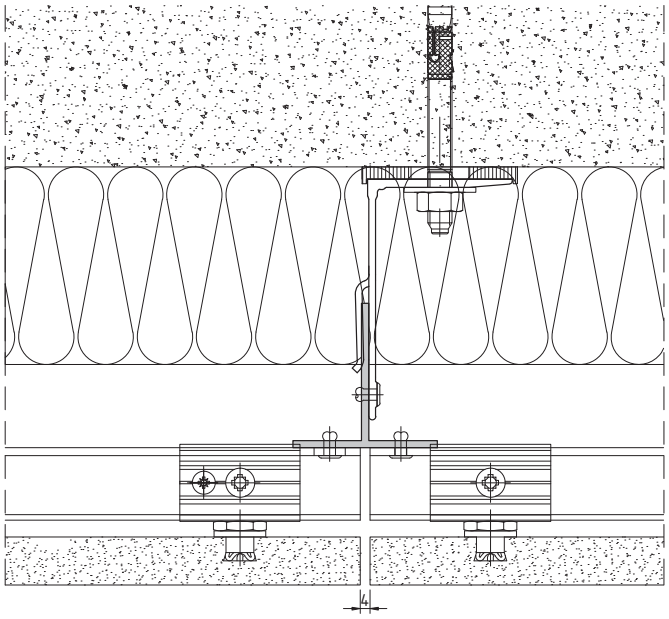
Application	hole type	B =
Fischer FZP/M6		60 mm
Fischer FZP/M8		

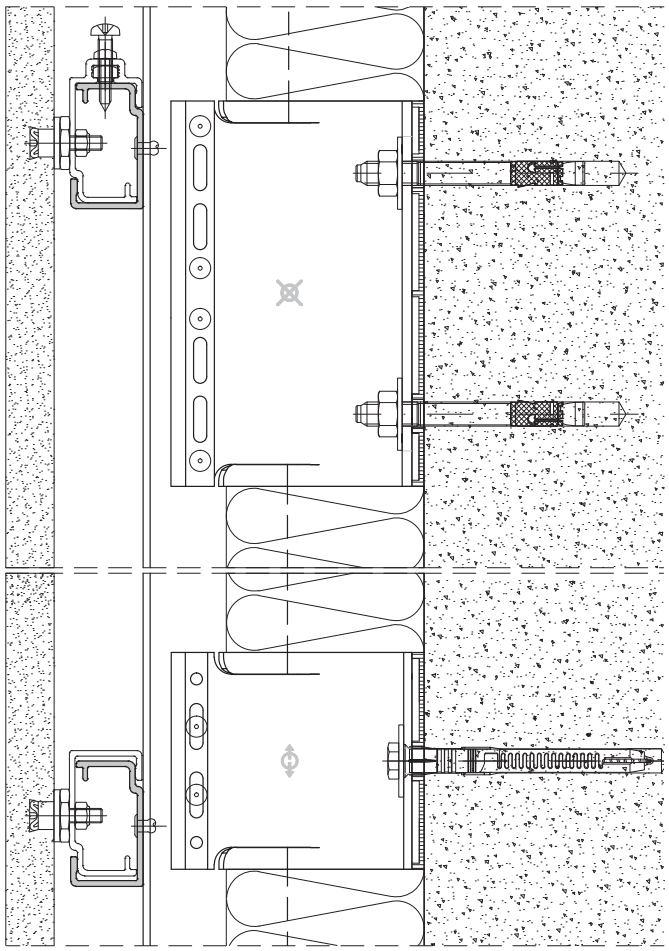
Forte L - Aluminium, Hanger Flexible Support



Application	hole type	B =
Fischer FZP/M6		60 mm
Fischer FZP/M8		

Forte L





Forte

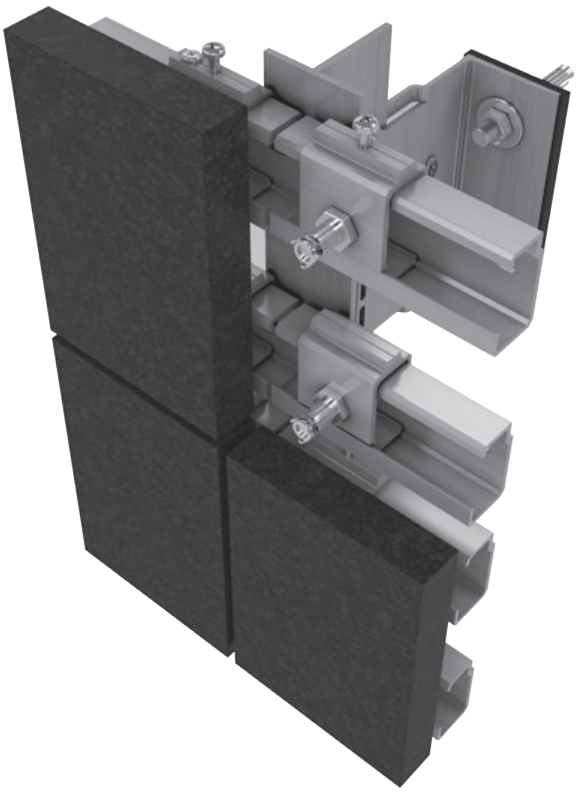
The system is designed for mounting heavy façade materials with thickness more than 25 mm. The profiles and accessories are constructed to bear extreme pressures, caused by façade materials with weights up to 90 kg per sq.M. Forte ventilated system uses undercut fixing anchors to guarantee the connections between the façade material and the main bearing structure of the system. It is an unique undercut technology for drilling and mounting of the anchor on the back (invisible) section of the façade material.

Main advantages:

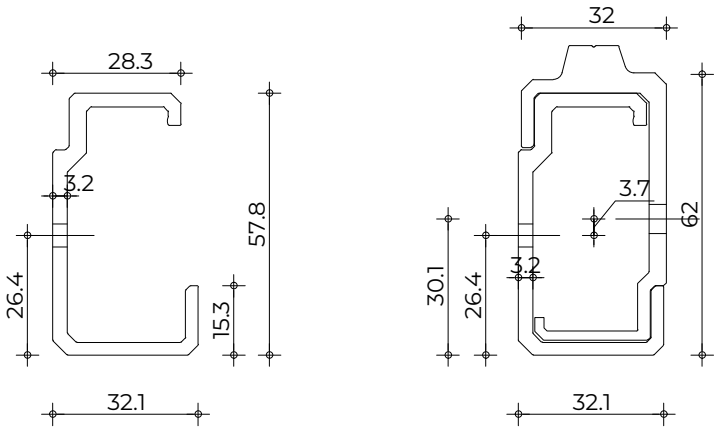
- perfect vision of the façade with no visible holding elements
- large variety of sizes and designs of the façade materials
- highest level of security when fixing the plates due to the undercut anchors possibility to
- use façade materials with thickness ranging from 25mm to more than 35mm
- fast and easy installation

Cladding Materials

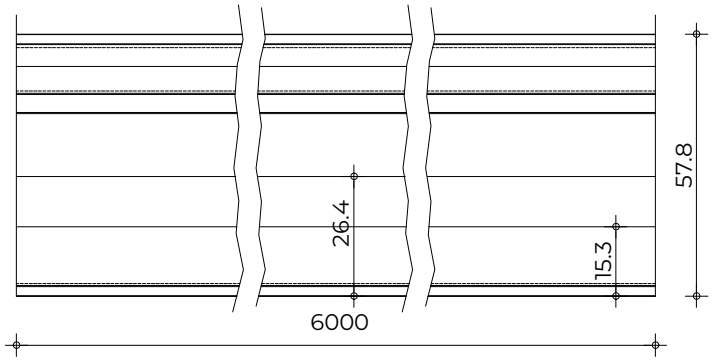
- Ceramic Tiles, Stone, Technical Stone, Light Transmitting Concrete



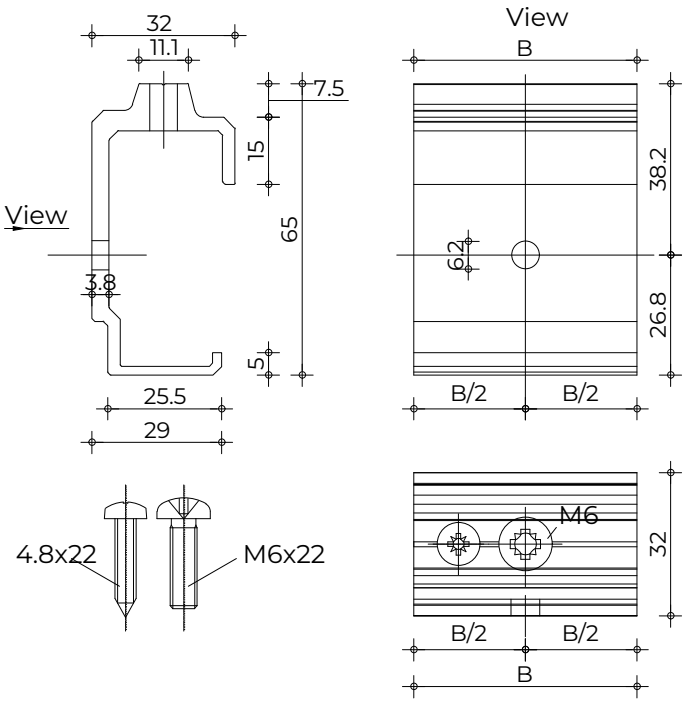
Forte - Aluminium, Horizontal Profile

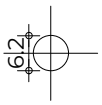
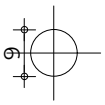


Horizontal profile

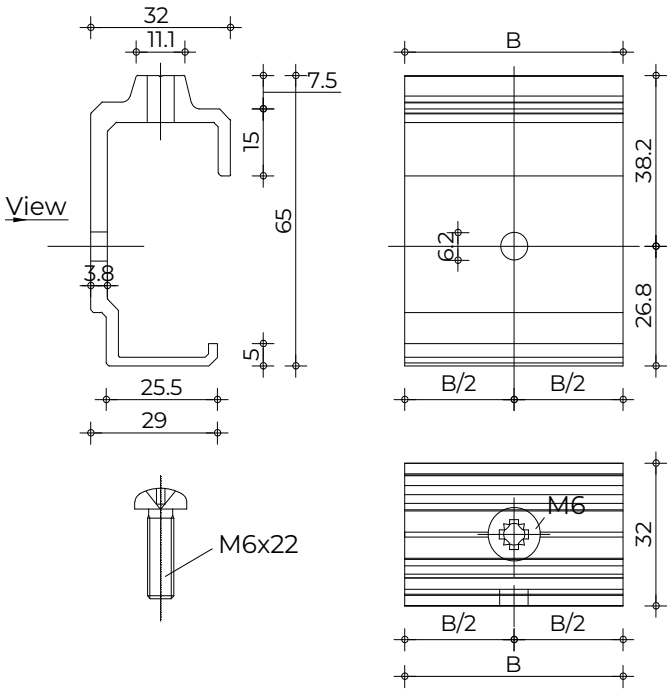


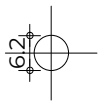
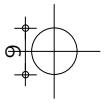
Forte - Aluminium, Hanger Adjustable for Fixed Support



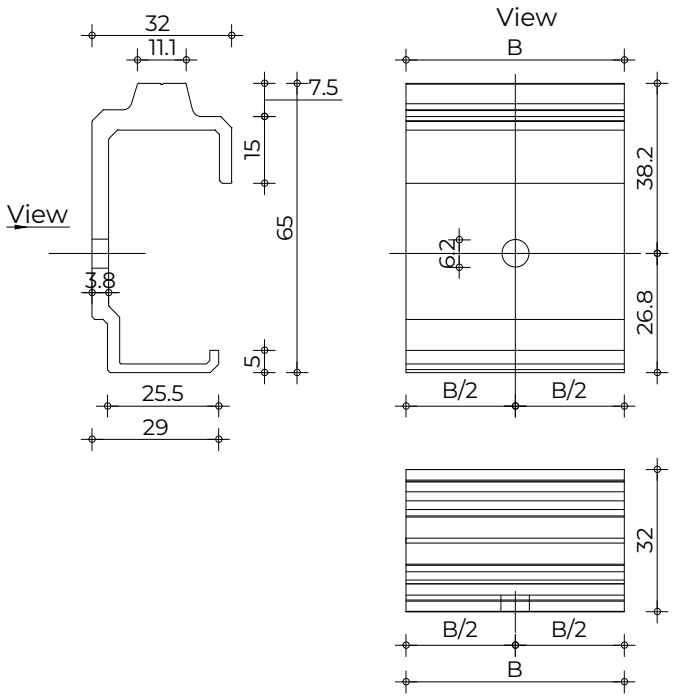
Application	hole type	B =
Fischer FZP/M6		60 mm
Fischer FZP/M8		

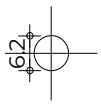
Forte - Aluminium, Hanger Adjustable for Flexible Support

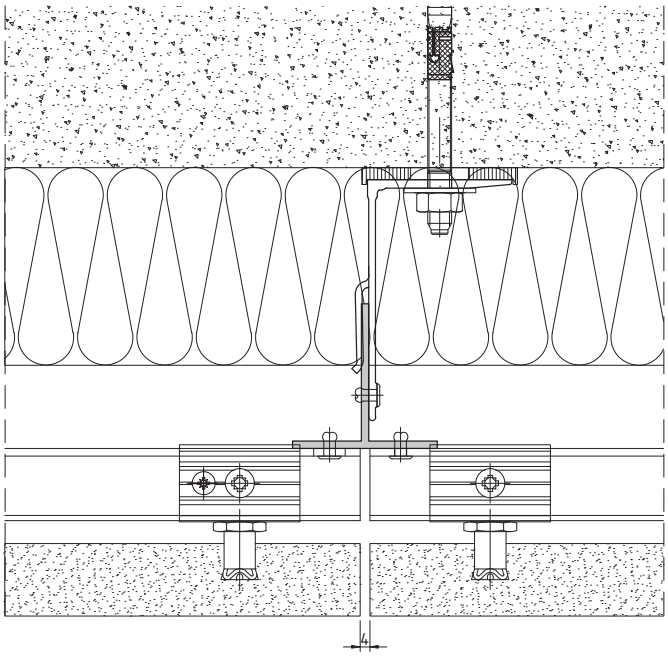


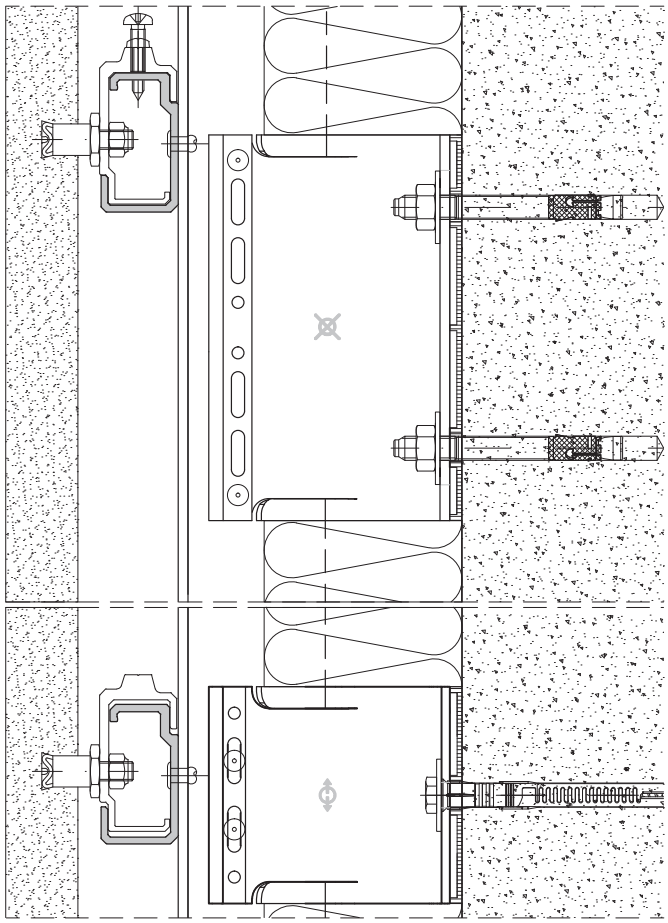
Application	hole type	B =
Fischer FZP/M6		60 mm
Fischer FZP/M8		

Forte - Aluminium, Hanger Flexible Support



Application	hole type	B =
Fischer FZP/M6		60 mm
Fischer FZP/M8		





Kerf

The system has been designed and specified to support ornate and shaped stone facade panels using a groove in the upper and lower edges of the facade panel. The horizontal rail is fixed to the vertical T and L rail using tek screws or rivet connections.

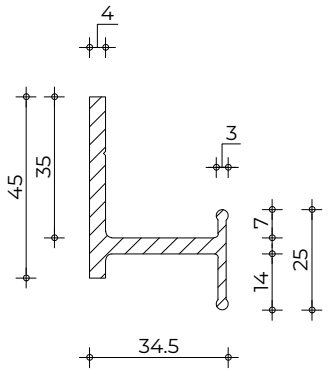
Main advantages:

- fast, easy and secure mounting of Ornate and stone facades over 40mm in thickness.
- optimization of the substructure by optimal load distribution to vertical supporting pillars
- materials suitable for hanging:
  stone
  ornate
- mounting method: horizontal profile connections

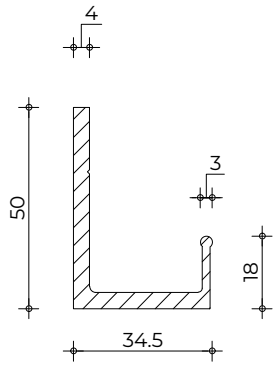
Cladding Materials

- Stone, Technical Stone, Slate

EVT II - Kerf Profiles for Stome Panels, Aluminium



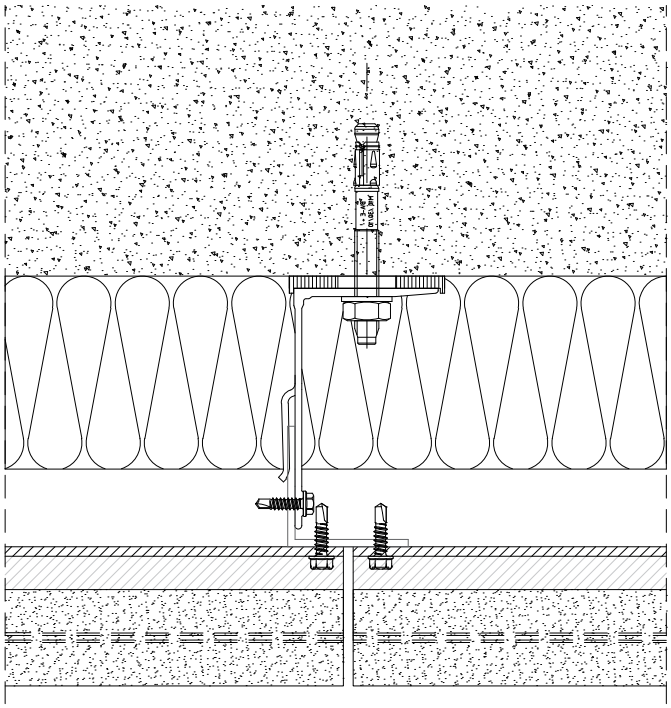
Intermediate 34 / 45

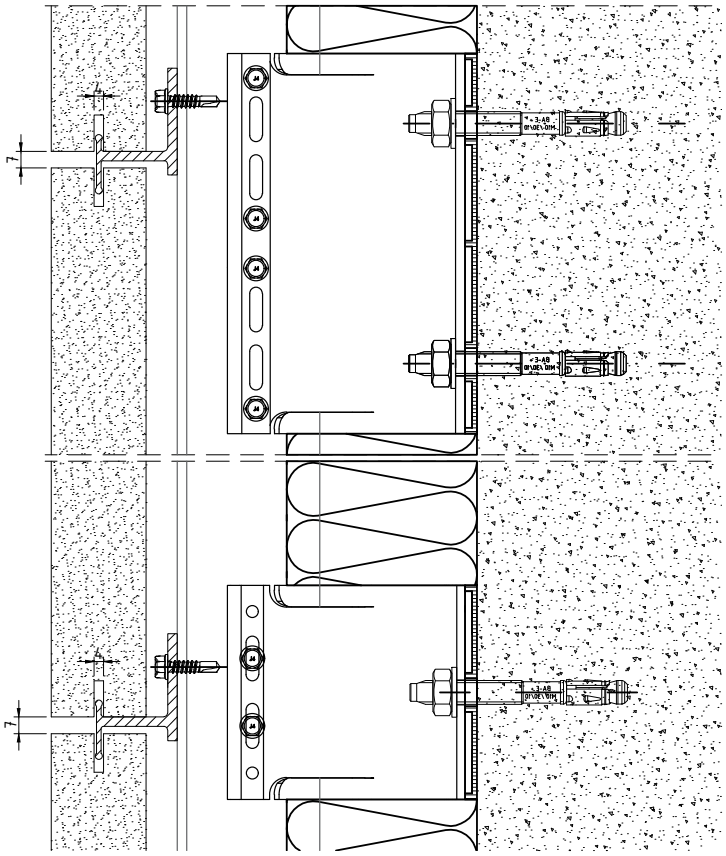


Upper / Lower 34x50

Item	Material
Kerf Profiles	Aluminum - EN AW 6063 T6

Kerf





Brickslip

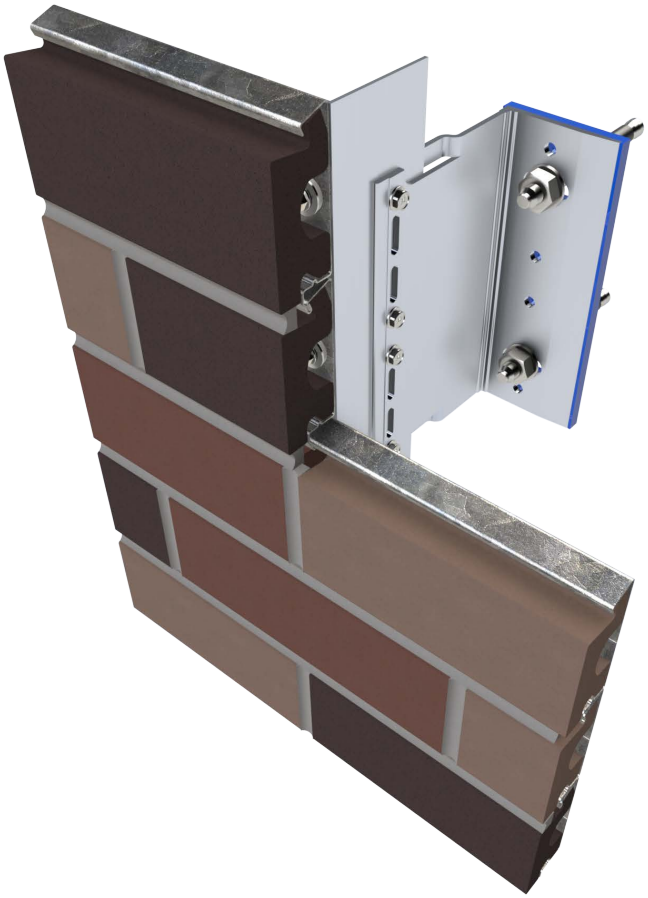
The system is designed to combine natural brick finishes with modern methods of construtcion using rainscreen support systems. Suitable as a lightweight and cost effective option comparing to the traditional brick build-up. The system uses vertical T & L profiles combined with a horizontal section (by others) used to support the brick tyles.

Main advantages:

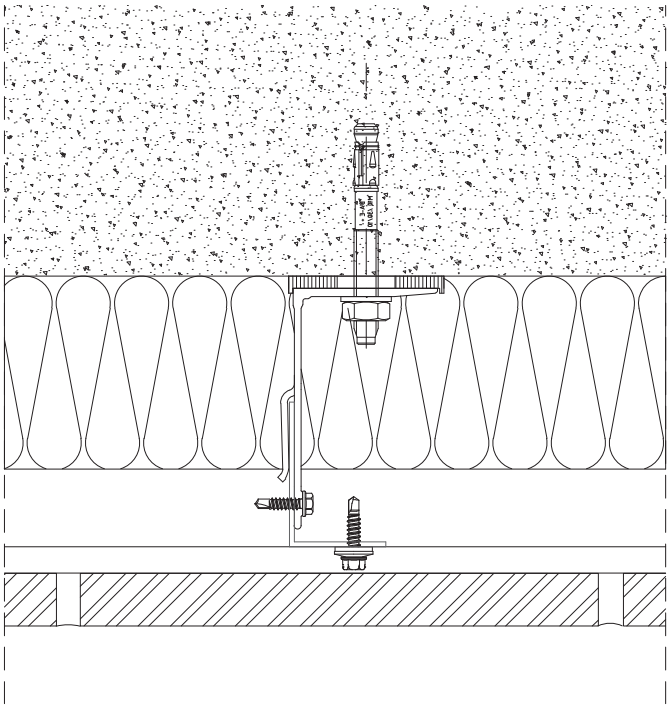
- fast, easy and secure mounting of Brick slip systems
- optimization of the substructure by optimal load distribution to vertical supporting pillars Materials suitable for hanging:
- Brick Tyles
- mounting method: Horizontal mounting system (by others)

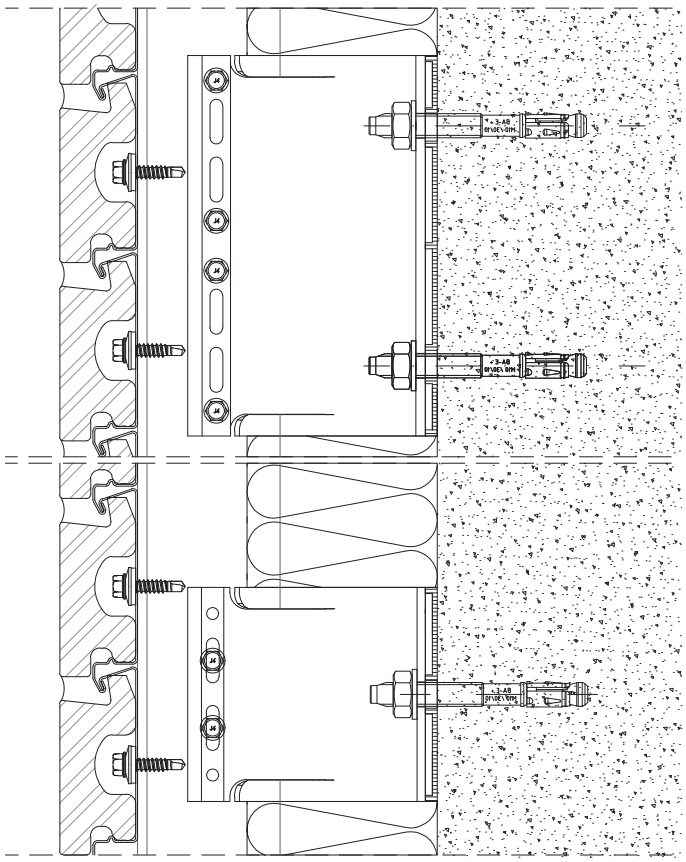
Cladding Materials

- Brick Slip Systems.



Brickslip

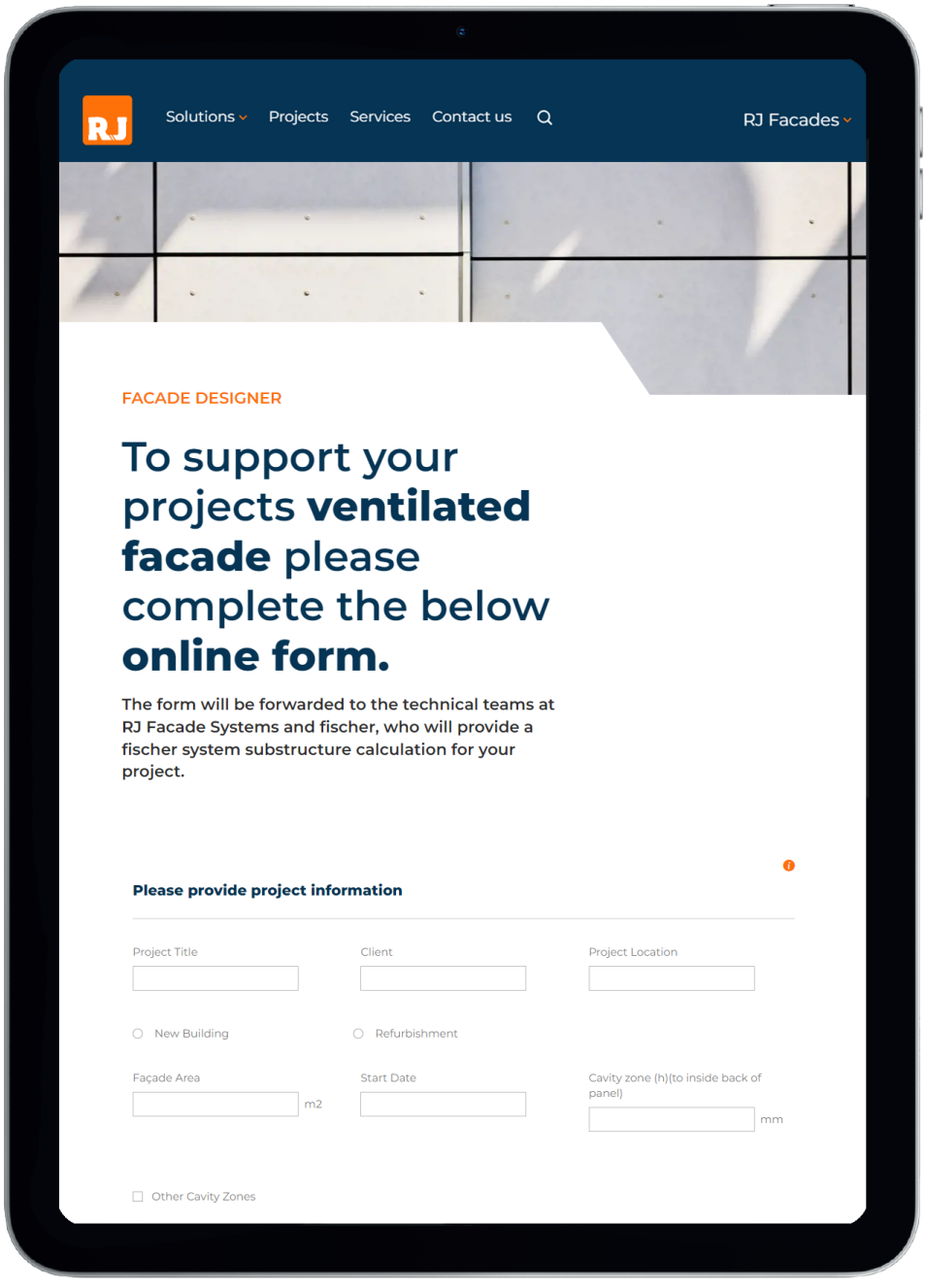




Facade Designer

RJ Facade Designer

For each calculation of new projects by the RJ Facades it is necessary for a project checklist form to be filled. It includes detailed information, which helps customers to receive a most accurate and precise offer. The offers may vary, depending on the cladding/façade material, the dimensions and weight of the material, wind load, floors heights, thickness of the thermal insulation. Also, structural base, raster of the façades, fixing methods and different ventilated facade systems. In order to achieve a qualitative calculation, it is necessary the drawings to be submitted via email/courier in CAD format. If there are any specific features of the project, these are also taken into consideration.



Standards & liability

Standards

General

EN 12020 (1÷2) - Aluminium and aluminium alloys - Extruded precision profiles in alloys EN AW-6060 and EN AW-6063

EN 755 (1÷9)– Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles

EN 573 (1÷3) - Aluminium and aluminium alloys - Chemical composition and form of wrought products

EN 15088 – Aluminium and aluminium alloys – Structural products for construction works – Technical conditions for inspection and delivery

EN 1990 Eurocode - Basis of structural design

EN 1991 Eurocode 1 - Actions on structures

EN 1998 Eurocode 8 - Design of structures for earthquake resistance

EN 1999 Eurocode 9 - Design of aluminium structures

Ventilated façade systems

ETAG 034, part 1 – Kits for external wall claddings, Part I: Ventilated cladding kits comprising cladding components and associated fixings

ETAG 034, part 2 – Kits for external wall claddings, Part II: Cladding kits comprising cladding components, associated fixings, subframe and possible insulation layer

CWCT Standard for Systemized Building Envelopes

EN 13830 - Curtain walling - Product standard

EN ISO 6946 - Building components and building elements - Thermal resistance and thermal transmittance - Calculation method

EN ISO 10211 - Thermal bridges in building construction - Heat flows and surface temperatures - Detailed calculations EN

ISO 14683 - Thermal bridges in building construction - Linear thermal transmittance - Simplified methods and default values

EN 13116 - Curtain walling - Resistance to wind load - Performance requirements

EN 12179 - Curtain walling - Resistance to wind load - Test method

EN 14019 - Curtain Walling - Impact resistance - Performance requirements

EN ISO 10140 - Acoustics - Laboratory measurement of sound insulation of building elements

EN 20140 - Acoustics - Measurement of sound insulation in buildings and of building elements

EN ISO 717-1 - Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation

Liability

The stated data and calculating methods are provided by RJ Facades as a guideline only.

The information given in this catalogue does not substitute all applicable regulations – Eurocodes, harmonized European standard, national or regional building codes.

The specific conditions and technical details of every particular project have to be take in consideration.

The right choice of all elements as well as any special requirements regarding stability of the structure must always be considered by the structural/façade engineer, responsible for the project.

The solution presented in these pages are indicative and cannot cover all possible project cases. Because of that every single project has to be evaluated by the structural/façade engineer in charge taking into consideration the specific features, such as climate conditions, location, orientation, etc.

RJ Facades is not liable for any calculation and conclusions made on the basis of the stated information. All calculations and specifications must be estimated, endorsed and guaranteed by architect, engineer, professional or legal entity authorized by law for such activities.

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